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NOTES ON LARVAL TREMATODES FROM NEW SOUTH WALES.¹

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DURING an investigation into the possible relationship between black disease in sheep and fluke infestation I became aware that very little was known as to the general question of the cercariae content of New South Wales water snails; it was uncertain which snail is the transmitter or transmitters of the sheep fluke in this country.

It thus became part of my work to investigate various snails and their distribution, habitat and so forth and more particularly to try to determine which of these transmitted the larval stages of *Fasciola hepatica*.

The result of that part of the investigation to date has appeared already in this journal⁽¹⁾⁽²⁾⁽³⁾ and tends to establish a strong *a priori* case that

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Limnaea brazieri (Smith) is the principal if not the sole transmitter in this State.

In the course of the work several cercariae and other stages of various trematodes were encountered and it is the object of the present communication to record the descriptions of some of those encountered.

That these descriptions are not as perfect as might be desired is a fact of which I am fully conscious as I am of my amateur status in this particular field.

In order to make the best use of the material I am sending full notes, drawings and microphotographs as well as preserved material to Dr. E. C. Faust, of Pekin, and other material to Professor Harvey Johnston, of Adelaide, who will no doubt in due course report more fully on the matter. In the meanwhile the following notes, drawings and microphotographs may be not without interest to other workers in the field.

The names given hereinunder are of a provisional nature with the exception that the name *Cercaria pigmentosa* has been applied by Cawston to cercariae apparently identical or closely similar to those so named by me.

¹ Submitted for publication, June 17, 1926.

Technique.

Most of the material dealt with in this paper has been obtained in and around Cooma, Bombala, Nimmittabelle, Jindabine and Adaminaby. Details of the collections are found in my previous papers. A certain number of control observations and collections were made in New England and in the Yass, Goulburn, Gunning and Queanbeyan districts. Over eight thousand snails of several species were individually examined by microscopical methods. The bulk of the snails were examined in the fresh condition, as hitherto I had not found the examination of preserved material or stained specimens very satisfactory. The procedure adopted for my examination was to take each snail and crush it between two slides and to make observations directly with the low power. To obtain further details portions containing cercariae were removed to a fresh slide and covered with a coverslip and examined either by a dry sixth or immersion twelfth inch objective. Measurements were made with the usual ocular micrometer.

Cercaria Pellucida (New Species?).

Cercaria pellucida (new species ?) has been found to be of very common occurrence at all times of the year in *Limnaea brazieri* and has also been encountered but less frequently in *Bullinus brazieri*. It is possible indeed that two very similar cercariae may be here confused, but, except for some variation in size which was noted, no other distinguishing characteristic has been encountered.

Description.

This is a small, almost transparent but none the less granular structured cercaria the details of which are for this reason difficult to make out (see Figures I. and II.). The body is usually oval when at rest, but may be extremely elongated with consequent narrowing. When swimming with the tail, the body is acutely bent to the ventral aspect, so that the appearance from the lateral aspect is comma-shaped. The movements of the tail are then very rapid, but in spite of this there is not much translatory or progressive movement. Actual movement from place to place seems to be the result of worm-like creeping motion. The cercaria possesses a stylet of characteristic spear-head shape and has two collections of gland cells which are found a little in front of the posterior sucker and from each leads a slender duct to the neighbourhood of the stylet point. The anterior and posterior suckers are both rounded and of nearly equal size. The posterior sucker projects ventrally when seen from the side. There is a well developed muscular pharynx and a simple intestine terminating in two branches. The branching occurs just anterior to the posterior sucker and the two caeca appear to extend only to the lateral aspects of this. The bladder is a well defined structure with lateral projections giving it a Y-shaped appearance. It undergoes considerable periodic changes in shape, some of which are indicated in the diagram (see Figure II.). Slightly granular cells are to be found through-

out the body and the above mentioned gland cells are notably stippled with granules. These cells are oval and have relatively small nuclei.

In the resting or oval state measurements of the body vary between 0.15 millimetre by 0.08 millimetre and 0.20 millimetre by 0.13 millimetre. In an extended condition the length of the body may be 0.30 millimetre or more, with, of course, considerable narrowing. The tail varies with the degree of extension from 0.15 to 0.25 millimetre.

Development and Life History.

The early sporocyst stages have not been certainly identified. Rediae are not developed. The cercariae develop as internal buddings inside sporocysts. These develop into elongated tubes which interlace throughout the digestive gland and in many cases almost replace its structure. The cercariae have a very limited life in water and are usually found dead or nearly so after twelve to twenty-four hours in tap water. Many degenerate and die even in an hour or so in preparations made by adding crushed snail to water. Sometimes, especially when the cercariae escape from the actual water and crushed snail juices and creep over the surface of the glass between the two opposed slides (then being in a moist atmosphere), cysts may be seen to form. These are round or slightly oval bodies without special characteristics, measuring about 0.11 millimetre in diameter. Cysts have not yet been definitely recognized under natural conditions. Nothing is known as to the future development or final host of this parasite. It seems quite possible it will be found in a frog.

Cort⁽⁴⁾ has described several cercariae under the general name polyadenous cercariae, some of which manifest considerable similarity to *Cercaria pellucida*. The figure he gives of *Cercaria isocotylea* and that of *Cercaria polyadema* bear many resemblances to *Cercaria pellucida*, but perhaps the closest resemblance is found in his *Cercaria brevicaeca* which differs from *Cercaria pellucida* chiefly in the shape of the excretory bladder.

Brown⁽⁵⁾ figures several cercariae of a closely similar type infesting *Limnaea peregra* and *Limnaea stagnalis* in England. Faust⁽⁶⁾ gives illustrations and descriptions of others which appear to be closely related, found in snails in China.

Cercaria Catellæ.

Cercaria catellæ has been found both in *Limnaea brazieri* and in *Bullinus brazieri* (Figures III., IV., V., VI. [a], VI. [b], VIII.).

Description.

This cercaria is one with very definite characteristics. Most prominent both in free and encysted specimens is the chain-like structure which has caused me to name it *Cercaria catellæ*. This is part of the excretory system and is a sinuous tube filled with highly refractile granules; it has a dark, stippled chain-like structure on either side of the body. These tubes are continuous with the latero-anterior prolongations of the rounded bladder.

Anteriorly they become thinner and run forward to the level of the pharynx where they turn outwards, loop inwards, curve outwards and bend inwards, again to become fine processes which are lost to view at the level of the posterior end of the pharynx. The anterior sucker leads through a funnel-shaped passage into the pharynx. From this the intestine passes as a straight tube which divides in front of the posterior sucker into two caeca. The latter extend on either side of the sucker backwards and apparently are prolonged almost to the extreme posterior end of the body. The course of the intestine and of the antero-lateral prolongations of the bladder are difficult to follow, partly owing to their proximity and partly owing to the number of granular cells that fill the posterior two-thirds of the body. There is a very definite chain of granular cells more or less quadrilateral in shape extending along either lateral margin from the level of the pharynx to the posterior extremity. The anterior third of the body is much clearer and flame cells can be recognized with ease as indicated in the drawing. Other flame cells are less readily made out in the positions indicated (see Figure III.).

The tail is a prominent and effective organ possessing a cuticular margin with transverse striation, a central core or cavity and between these several rows of cells.

In the oval stage the body measures from 0.25 millimetre by 0.11 millimetre to 0.30 millimetre by 0.13 millimetre. It may extend to 0.45 millimetre or more with narrowing. The tail ranges between 0.20 millimetre and 0.40 millimetre according to its degree of extension.

Development.

The early sporocyst stages have not yet been determined by me. Rediae and probably daughter rediae are present. Large rediae may be found 1.00 millimetre long or longer and then may be 0.20 millimetre broad. Mature cercariae have been found in rediae which measured 0.40 by 0.15 millimetre. The redial shape varies, but is frequently typical, the muscular collar and ambulatory processes being well seen. The pharynx is a strong muscular organ. The blind intestine is a club-shaped process in mature specimens, extending little beyond the collar, but in earlier rediae it is relatively longer, extending about two-thirds of the length of the worm. The rediae are frequently bright yellow in colour, but this seems to be inconstant.

The cercariae swim actively in water for a while, making use of the tail and also making sweeping movements. The latter method is the chief means of propulsion though the tail seems to be a more active organ in this respect than in the case of *Cercaria pellucida*.

Cyst formation has been observed and is similar to the process to be described later under *Cercaria pigmentosa*.

Cysts of the same size and characteristics have been found in great numbers in the pericardium of *Bullinus brazieri*. Here they occur in groups of a hundred or more. Less frequently and in fewer numbers they have been found in *Limnaea brazieri*.

Tailless young have been seen to emerge from these cysts. The cyst itself is round and has a well defined, double contour and the chain-like structure is distinctly visible inside. The same may be said of a series of spines not noticed in the tailed cercaria.

The cyst measures 0.13 to 0.16 millimetre in diameter.

An interesting fact may be mentioned. Although I have made repeated examinations of a certain pond near Cooma where there are large numbers of *Bullinus brazieri* (separate examinations of snails were made in April, June, October and December) and over four hundred snails were searched individually, the highest cercaria percentage was four, whereas in the same examination at least 74% possessed large numbers of cysts. Taking all the facts known at present it seems probable that the cercariae emerging from the relatively small number of infected snails attain a much greater distribution in the cyst stage by penetrating as cercariae other snails of the same species and there encysting. This fact strongly suggests that the final host is one or other, perhaps several, of the birds feeding on the snails of such lagoons.

The discovery by me of stages in the life of at least one echinostome in the intestine of the hoary-headed grebe (*Poliocephalus poliocephalus*), the coot (*Fulica atra*) and in the mountain duck (exact type of duck not yet identified), all of which birds live on such lagoons in Monaro, and the finding by me also of two adult echinostomes in the grebe which are shortly to be described fully by Harvey Johnston, make it reasonably certain that *Cercaria catellæ* is the larval stage of an echinostome infesting in the adult stage one or more water birds. As I am publishing a separate communication on the echinostome larval stages found in the above bird and their individual relationships to the adult stage and to *Cercaria catellæ*, I shall content myself here with these remarks concerning the possible further development of this cercaria. Inasmuch as it may prove that there are varieties of specific nature not yet detected by me in the cercariae grouped for the present under one name (*catellæ*) and as there are possible fallacies from arguments based on the similarities in the cyst or tailless young stage, it is well to preserve some caution on the matter of the life cycles of these trematodes. There is another matter of interest in connexion with the above description of *Cercaria catellæ*. Cobb⁽¹²⁾ claims that he had discovered the larval stage of the sheep fluke in *Bullinus brazieri*. Although his illustrations of the snail in his second paper are composite drawings of *Limnaea* and *Bullinus* and the drawings of the cercariae found by him are not sufficiently clear to be positively identified, it seems possible that the cercariae described by him were of the type called by me "catellæ." So far, I have never found in *Bullinus brazieri* any cercariae that could possibly be the early stage of *Fasciola hepatica* and/or *gigantica*, yet the general first sight appearance of this cercaria is superficially like Thomas's description. Moreover, as the echinostome characteristic (the circle of spines does not develop in the tailed cer-

cercaria stage) the general similarity is enhanced. On the available facts, however, the spineless cercariae and the spined larvae in the cyst and probably some if not all the tailless but spine bearing young seen in the birds, seem parts of one life cycle; if so the probable relegation of *Cercaria catella* to the echinostomes is not without practical use in the general question of sheep fluke spread in this State. Similar cercariae are figured by Brown,⁽⁵⁾ Cort,⁽⁴⁾ Manson-Bahr, Fairley,⁽⁷⁾ Nicholl,⁽⁸⁾⁽⁹⁾ Lebour⁽¹⁰⁾ and others.

Cercaria Greeri.

Cercaria greeri.—This cercaria, named by me after my assistant who first found it, has been so far found only in a small number of samples of *Bullinus brazieri* from two or three situations in Monaro. It was first found on November 25 between Cooma and Adaminaby and about twenty miles from Cooma. Subsequently it has also been found in the same snails in a pond about a mile or so north of Cooma and also in specimens sent from a station at Jones Plain about thirty miles west of Cooma (Figures VII. and IX.).

Description.

This is a furcocercous cercaria and is characterized by the possession of a split or furcate tail and a small body. It closely resembles various of the furcate cercariae described by Cawston. It has a small, oval body when at rest, but this can be extended and assume an elongated appearance. In the oval state the body measures from 0.10 millimetre by 0.05 millimetre to 0.15 millimetre by 0.08 millimetre. The tail consists of a trunk or undivided portion which measures between 0.14 millimetre and 0.18 millimetre and two terminal processes or furcae which vary between 0.15 millimetre and 0.17 millimetre. These processes not only adopt various angles of incidence with the trunk of the tail depending on their movement relative to the trunk, but apparently have the power to bend on themselves, sometimes being concave to the central axis, at other times convex. The suckers are rounded, the anterior measuring about 0.03 millimetre in diameter, the posterior being very slightly smaller.

Not much of the detailed structure has been made out, but the bladder bifid anteriorly and prolonged into two lateral tubes running forward can easily be made out. Two masses of stippled cells can also be seen, one mass on either side, chiefly antero-lateral to the posterior sucker. These appear to be glands and their duct or ducts can be indistinctly made out on either side, running forward to disappear behind the oral sucker. The tail has a central canal apparently continuous with the base of the bladder. I have so far been unable to determine the course of the intestine. No pharynx seems to be present.

Development.

The only stages of development noted so far are the long germinal tubes or sporocysts in which the cercariae develop. Some of these are very long, 2.0

millimetres or more. No cysts have been noted and nothing is known as to other stages of the trematode's life history.

Cercaria Pigmentosa.

Cercaria pigmentosa (Cawston) appears to be identical with or closely similar to the cercaria similarly named and described by Cawston⁽¹⁶⁾ and Faust⁽¹¹⁾ (Figures X., XI., XII.).

This cercaria has so far been found by me only in *Limnaea brazieri*. In the Monaro district it has been noted that the percentage infestation rate in infested snails is usually not great. The usual figures obtained from various snail batches vary from 1% to 4% and indeed many of the samples from certain spots are quite free from infection.

In view of the probability that *Cercaria pigmentosa* represents the larval stage of the sheep fluke, these findings are consistent with the general nature of the usual type of fluke infestation in this particular district. In Monaro the fluking of sheep is generally a chronic process. Many sheep are in fact infested with relatively few flukes. Acute disease such as occurs in liver rot is exceptional. One would expect, therefore, to find the conditions as regard larval fluke content of the snail as I have found them. Occasional outbreaks of liver rot do occur and it is interesting to note that in the only instance of this seen by me in which nearly a thousand sheep died rapidly with acute hepatitis associated with the presence of enormous numbers of flukes, the source of infection was known to be a particular spring. In this spring the infestation rate with *Cercaria pigmentosa* was approximately 16%.

In this connexion I must refer to the astounding statement made by McKay⁽¹⁸⁾ in writing of fluke distribution in the Cooma district. He states: "There is practically speaking very little or no fluke in this district according to pastoralists."

I am afraid Mr. McKay does not know the pastoralist very well or is of a very trusting disposition, if he expects the pastoralists to admit at all readily that their holdings are fluky, but even this naïve faith being admitted, I am surprised that he did not make the simple tests necessary to check this matter. Had he done so before including such a statement in his paper, he could easily have proved beyond all doubt that fluke is present in a very large number of sheep in the immediate neighbourhood of Cooma. In view of his own⁽¹⁷⁾ published statement that has, of course, been a matter of common knowledge for years, that the rabbits in the Cooma district are as a rule heavily infected with fluke, this statement or quotation seems the more ridiculous.

Description.

This cercaria is the largest I have so far found of the tailed type. Measurements are given below. Details of the structure are hard to make out owing to the presence on either side of a boomerang-shaped mass of what appears at first to be pigment, but on

closer analysis is actually seen to consist of cells including numerous highly refractile granules. These granules appear as dark bodies when examined by transmitted light and as pure white bodies when seen in reflected light. At times, however, the granule masses are less distinct and frequently cercariae are seen that have a diffuse, dark appearance of very varying density, sometimes obscuring all structure except the anterior sucker region, at other times allowing a clearer view of other details. As far as I have been able to follow the structure, I have not been able to discern any difference between my material and the preserved samples kindly sent me from South Africa by Cawston. I do not intend to burden the present communication with much further description. The details are sufficiently well seen in the accompanying drawings and photographs which can be compared with Thomas's⁽¹⁴⁾ drawings and those of Faust.⁽¹¹⁾

In the oval condition the body measures from 0.25 millimetre to 0.32 millimetre long by 0.16 millimetre to 0.20 millimetre broad. The body is very extensible and may have a length measurement of 0.40 to 0.50 millimetre or more with corresponding narrowing. The tail measures from 0.50 millimetre to 0.60 millimetre in length and is about 0.06 millimetre at its broadest part. The tail may extend to 0.90 millimetre. The cyst to be referred to later measures 0.17 millimetre in diameter.

Measurements of this cercaria are very difficult to make owing to the extremely variable shape of the body in the living condition and the tendency of the body to flatten and elongate after death. Several times the cercaria has been found actually shorter in the antero-posterior diameter than in the transverse, the body then being a depressed cordate shape. For example one antero-posterior measurement was found to be 0.10 millimetre and the transverse as 0.20 millimetre.

Development.

This cercaria passes through a redial stage and there are also daughter rediae to be made out. The early sporocyst stage has not been positively identified by me. The number of rediae in one liver is not usually great; there may be three or four only found or there may be a dozen or so.

The liver tissue does not seem to be encroached upon to the same extent as in the case of *Cercaria pellucida*. Rediae having the length of 2.75 millimetres by 0.50 millimetre have been noted. The rediae are typical as described by Thomas and sometimes distinctly yellow in colour. Cysts are formed readily on the slide and the whole process has been watched repeatedly which occurs in the manner fully described by Thomas.

Although the full scientific proof linking this cercaria, *Limnaea brazieri* and the adult sheep fluke is yet wanting, there seems little doubt that the cercaria described, which is found in *Limnaea brazieri*, is indeed the larval stage of the sheep fluke and is the cercaria described by Thomas as inhabiting *Limnaea truncatula* in the old world. Whether or not there are other snails capable of transmitting the sheep fluke, it has been abundantly shown by

me that there are good grounds for considering that *Limnaea brazieri* is the chief transmitter in many areas, possibly in nearly all the areas in which fluke exists in this State. Apart from the epidemiological reasons adduced in my previous papers⁽²⁾ there have since come to light other facts bearing on the case. The comparison of South African rediae and cercariae with mine is one of these facts and strongly supports my contentions. Parenthetically it may be stated here that there seems still some doubt as to the differences if any between *Fasciola hepatica* and *Fasciola gigantica* and their cercariae; Cawston's *Cercaria pigmentosa* is usually marked as being the cercaria of the latter.

McKay's⁽¹⁵⁾ first paper contains no evidence whatsoever, being a mere claim of "conclusive proof" unsupported by any real facts. In his second paper,⁽⁹⁾ while giving us some of the facts necessary to form a partial opinion, he withholds still very material data as to controls (usually considered a most necessary part of "conclusive proofs"). My own recent communication⁽³⁾ showing that the *Cercariae pigmentosæ* developed in a proportion of 40% of aquarium bred snails placed in the presence of eggs of *Fasciola hepatica* is itself not as completely precise as I would have desired, but can scarcely be explained otherwise than that the *Cercaria pigmentosa* described above and in my previous papers are the cercariae of the sheep fluke developed from the added eggs.

A final point arises here; it is one that is related to the possible differences, if any, between the cercariae of *Fasciola hepatica* and *Fasciola gigantica*. It is possible that under the term *Cercaria pigmentosa* I have described two or more closely related species. At first, indeed, when I noted the wide differences in degree of "pigmentation" shape of cercariae and size especially of the tails, I believed that there were two species. Since then I have found so many intermediate types and seen such different looking cercariae in the same rediae, that I have preferred temporarily to assume that there is but one type. This assumption, however, is for the convenience of the present and it seems quite possible that later differential characteristics will be found separating at least two types which may explain the differences in *Fasciola hepatica* and *Fasciola gigantica*.

McKay⁽¹³⁾ has already suggested that there are several similar types of "fasciolid" cercariae to be found in *Limnaea brazieri*, but unfortunately his description of these is largely characterized by its absence and in spite of all he writes to the contrary, he may be confusing with *Cercaria pigmentosa* the two very distinct cercariae described herein as inhabiting this snail, one of which is an echinostome, the other one of the polyadenous stylet cercariae.

Cercaria Nigrocystica (Sp.?).

Description.

In this case no tailed cercariae have been found, the specimens described and figured (Figures XIII. and XIV.) being larval trematodes probably more or less recently emerged from the cyst stage and found

by me in the mixed bowel contents of two "black snakes" (precise identification not possible) found near Berridale-Monaro.

The drawing shows clearly the principal structures visible in the specimens. The dark looking bladder filled with large and highly refractive granules is a prominent feature; the intestine has also granular characteristics. There are two suckers of which the anterior is the larger, having a diameter of 0.16 millimetre, the posterior having a diameter of 0.10 millimetre. The lengths of the specimens in the drawing were 0.7-0.9 millimetre, its breadth 0.26-0.28 millimetre. In the same bowel contents was found a sexually mature but damaged specimen of an amphistome, but it does not seem at all probable that this was in any way related to the immature forms found.

On the other hand certain cysts and the tailless larvae emerging or expressed therefrom found by me in New England in *Segmentina australis* were of a very similar nature to the above described larva. As I have so far no evidence that *Segmentina australis* is present in or around Berridale, the information available does not enable me to generalize at all as to the possible relationship between the two sets of observations, still less to pronounce as to the possible life cycle of *Cercaria nigrocystica*.

Other Probable Trematodes.

Several other bodies probably representing stages in the life cycles of other trematodes have been encountered, but are not as yet sufficiently understood to be described with advantage.

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SOME OBSERVATIONS ON THE DICK TEST AND ON THE PROPHYLACTIC USE OF SCARLET FEVER ANTITOXIN.

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THE fact that, in so far as I am aware, no work on the Dick test for susceptibility to scarlet fever has been published in Australia, encourages me to present these results which, though few in number, may be of some interest. The same fact must be my excuse for prefacing them with a brief account of the test. Early in 1924 Drs. George and Gladys Dick⁽¹⁾ published work in which they showed that a specific haemolytic streptococcus plus a soluble toxin produced by that streptococcus were the cause of scarlet fever. They isolated a haemolytic streptococcus from the infected finger of a nurse who developed scarlatina while attending a patient suffering from the disease and by inoculations of the pure culture and of the filtrates, produced attacks of typical scarlet fever in volunteers. They therefore claimed that:

Since the streptococci used in these experiments fulfill all the requirements of Koch's laws, it may be concluded that they cause scarlet fever.

As things stand at present, therefore, scarlatina is considered to be a local disease of the nasopharynx caused by the specific haemolytic streptococcus which produces a soluble toxin. This when absorbed into the system gives rise to the constitutional symptoms and rash and presumably, if not neutralized, lowers general resistance and allows the later coccal complications to arise. With this explanation the immunity conferred by an attack of scarlet fever is antitoxic. It is of interest to note in this connexion that Dr. Scholes⁽²⁾ in his textbook published in 1920 prophetically remarks from clinical observation that:

In scarlatina there are two factors; the intoxication caused by the specific poison and the lesions produced by the cocci.

In view of the above the Dicks have evolved an intracutaneous susceptibility test analogous to the Schick test for diphtheria. In this test they can determine whether or no a person is immune to the disease by injecting a minute quantity of a suitable dilution of the toxin into the skin of the forearm. A positive response to the test indicates that the individual does not possess sufficient antitoxin to neutralize the injected toxin and is therefore liable to acquire the disease, whereas failure to react presumes that he is immune.

They also found that these injections gave a very high percentage of positive reactions in the first few days of scarlatina and an equally high percentage of negative results in the later weeks of convalescence.

Furthermore they have shown that individuals can be actively immunized against the disease by injecting them with increasing amounts of the toxin and finally that from the toxin a specific antitoxin can be prepared which has a definitely beneficial action on the disease.

As the Dick test is a quantitative one and as the toxin owing to the complete absence of response of animals to injections of the filtrate has to be standardized on human beings, a very lengthy and unsatisfactory method and finally as many individuals react in a different manner to a similar dose of toxin, the standardization is at present a matter of some difficulty.

After several attempts at growing strains of haemolytic streptococci in various media, I was fortunate enough to secure a toxin which appeared as if it would give satisfactory results. This particular strain of streptococcus was isolated from the naso-pharynx of a child suffering from a moderately severe typical attack of scarlet fever. The organism was grown in nutrient broth with a pH reaction of 7.8 and with 5% citrated horse blood added. After five days the culture was filtered through a Pasteur F. candle, tested for sterility and bottled without preservative.

I have standardized this toxin by its behaviour towards scarlet fever patients which in the present state of our knowledge appears to be the most satisfactory method. This involves a number of preliminary injections on patients in various stages of the disease and owing to the somewhat strenuous objections of our Australian children to more than a certain number of injections and to the comments of adults in the wards, is easier than the probably more accurate method of determining the minimal dose of toxin to produce a reaction on a number of patients and averaging it.

With the former method of standardization one must obtain a high percentage of positive results in the first few days of scarlet fever and a satisfactory percentage of failures to react after three weeks of the disease. In the following experiments 0.2 cubic centimetre of a one in a thousand dilution was used, as a one in five hundred dilution gave some rather violent local reactions and a one in two thousand dilution did not appear to be giving a satisfactory number of positive results. It is probably not the optimum dilution, but the results appear to compare favourably with figures from England and America.

The specificity of the toxin was tested in the following ways:

1. One cubic centimetre of the scarlet fever antitoxic serum used in the experiments below was added to two cubic centimetres of a one in a thousand dilution of toxin. Seven children who had given

marked positive reactions a few days previously, were given 0.3 cubic centimetre of the mixture. In every case no reaction occurred.

2. Similar results were obtained with a mixture of toxin and scarlet fever convalescent serum.

3. Admixture of toxin with polyvalent anti-streptococcal serum and with normal horse serum has no effect on the toxin. The patients reacting to the Dick test still reacted.

4. A number of children who gave positive results were injected with either 2.5 cubic centimetres or 5.0 cubic centimetres of scarlet fever antitoxin. In the large majority of cases no reaction occurred at a forty hours' retest (*vide infra*).

5. Five persons who reacted were injected with five cubic centimetres of antistreptococcal serum and five with a similar amount of normal horse serum. In every case a response to the Dick test was obtained on retesting.

6. A horse is being inoculated with the toxin at the Commonwealth Serum Laboratories and the serum from an interim bleeding which Dr. Morgan kindly had done for me, gives a typical Schultz-Charlton rash blanching reaction in every case of scarlet fever—twelve in all—in which it has been tried, both with the pure serum and with dilution of one in ten, one in fifty and one in one hundred.

The toxin is fortunately extremely thermostable in contradistinction to the diphtheria toxin. I have found a dilution of one in a thousand to be as potent after one month as a fresh dilution. This saves the tiresome business especially in institutional work of preparing a fresh dilution every time an odd test is to be made.

The technique of the test is similar to that of the Schick test. The skin of the forearm is cleansed with methylated spirits and 0.2 cubic centimetre of the one in a thousand dilution of toxin injected intradermally. A similar dilution of toxin heated to 100° C. for an hour in a water bath is used as a control.

The reaction appears at about six to eight hours and reaches its height at the end of twenty-four hours, when it should be read. If the result is positive a red erythematous area varying in size from twenty to seventy millimetres is present. Almost invariably it has faded by forty-eight hours, but occasionally leaves an area of pigmentation which may desquamate. I have found the persistent reaction to occur more particularly in my most susceptible age group of two to three years. Very occasionally I have observed painful swelling and induration. The reaction appears more quickly, lasts a shorter time and disappears more quickly than that of the Schick test. It unfortunately coincides with the time incidence of a pseudoreaction and this makes it necessary that the utmost care be used in making injections, as if a pseudoreaction should occur, the reading consists of a comparison of the two arms. If one area is larger or more intense than the other, a positive reaction is recorded and if they are alike, the reading is regarded as no re-

action. I have had very little trouble with pseudo-reactions, even in patients who have had diphtheria antitoxin and they are not notified in the tables of results given below.

Previous to the experiments with my toxin I had made some hundreds of injections with the original Dick toxin, kindly supplied to me by Dr. T. W. Sinclair. As I have not the complete records which I should like in the light of later knowledge, they are not included in this paper except in one instance. The percentage of positive results obtained in a group of convalescent diphtheria patients, however, corresponds closely with the percentage in a similar group in which my toxin was used, being 46.1 over all ages with the former and 47.3 with the latter.

Observations on Intradermal Tests in Six Hundred and Six Patients.

These patients with the exception of Groups I. and III. consist of children, with a small proportion of adults, suffering from various stages of scarlet fever, diphtheria, whooping cough and measles. I have had no opportunity of testing normal healthy children and am unable to say how their results would compare with those given below.

Group I.—Mothers and Babies.

Group I. consists of forty mothers and babies up to ten days old who were injected at the Women's Hospital. This was done to determine whether there was a placental transmission of scarlet fever antibodies. Of the forty patients thirty-six mothers and babies gave no reaction and the remaining four mothers and babies a positive reading. Three of those who yielded no reaction, gave a previous history of scarlet fever. The reactions of the babies were not so pronounced as those of the mothers.

This places scarlet fever in the same category as diphtheria in which there has been shown to be a transmission of antitoxin from mother to baby.

Group II.—Scarlet Fever Patients.

Group II. comprises two hundred and seven patients suffering from scarlet fever injected at various stages of the disease and the results are shown in the accompanying table.

It will be seen that the percentage of positive results in the first four days is satisfactory, being 92.3 and the gradual diminution of positive results up to the sixteenth day is shown. The percentage

of 85.2 who did not react after the third week, is fairly satisfactory, but several cases occurred in which the test remained definitely positive up to six weeks and in one case two months. These patients were all considered to have been clinical scarlatina.

A peculiar case occurred in a child, aged six years, who was admitted with typical scarlet fever and gave a marked positive reaction four weeks later. Four days after his injection he had what was considered to be a true relapse. Three weeks after this he still give a positive result, but of only half the area of his previous reaction.

Apparently, then, certain cases occur in which the individual appears unable to manufacture antibody as shown by immunity to a skin dose of the toxin, or does the possibility arise in these instances that we are dealing with a different strain of scarlatinal toxin-producing streptococcus?

Group III.—Nurses and Medical Officers.

Group III. consists of fifty-five nurses and medical officers resident at the Infectious Diseases Hospital. Of the total number seventeen gave a history of scarlet fever, in the majority of cases acquired while nursing at the hospital. Of these seventeen, fourteen gave no reaction and three reacted. The cases of the three who reacted, could be investigated. One was a remarkably severe infection, with the extremely septic throat, brilliant rash, high temperature and delirium. The test was done four months after the patient's discharge. The other two were mild infections, but clinically were considered definite. Among those without a history of scarlet fever, numbering thirty-eight, there were seventeen reactions, a percentage of 44.7. Among these were three anomalies, one being a sister who had been in charge of a male scarlet fever ward for four years and who gave a reaction, and the other two being resident medical officers who have been at the hospital for some years and during that time have not developed the disease. They both reacted and one of them is believed to have had scarlet fever in infancy.

Group IV.—Diphtheria Convalescent Patients.

In Group IV. are included two hundred and eleven patients convalescent from diphtheria. The results of the tests are shown in Table II. and in the graph.

The highest positive percentage will be seen to be in the two to three age group, the one to two group being too small for consideration.

TABLE I.—SHOWING THE REACTION OF TWO HUNDRED AND SEVEN PATIENTS TO THE DICK TEST.

| Duration of Disease in Days. | Number of Patients. | Number of Patients Reacting. | Number of Patients Not Reacting. | Percentage of Reactions. |
|------------------------------|---------------------|------------------------------|----------------------------------|--------------------------|
| 1 to 4 | 65 | 59 | 6 | 92.3 |
| 5 to 8 | 31 | 24 | 7 | 77.5 |
| 9 to 12 | 28 | 14 | 14 | 50 |
| 12 to 16 | 21 | 5 | 16 | 23.8 |
| 17 to 40 | 62 | 9 | 53 | 14.8 |
| | | (3 faint positive) | | |

TABLE II.—SHOWING RESULTS OF THE DICK TEST IN TWO HUNDRED AND ELEVEN PATIENTS CONVALESCENT FROM DIPHTHERIA.

| Age Group in Years. | Number Tested. | Number of Patients Reacting. | Number of Patients Not Reacting. | Percentage Reacting. |
|---------------------|----------------|------------------------------|----------------------------------|----------------------|
| 1 to 2 | 6 | 4 | 2 | — |
| 2 to 3 | 15 | 10 | 5 | 66.6 |
| 3 to 4 | 29 | 19 | 10 | 65.5 |
| 4 to 5 | 25 | 16 | 9 | 64 |
| 5 to 6 | 32 | 17 | 15 | 53.1 |
| 6 to 7 | 29 | 13 | 16 | 44.8 |
| 7 to 10 | 39 | 12 | 27 | 30.7 |
| 10 to 15 | 26 | 7 | 19 | 26.9 |
| 15 to 30 | 10 | 2 | 8 | 20 |
| Total | 211 | 100 | 111 | 47.3 |

From this age group on there is a gradual diminution of reactors up to the highest age group fifteen to thirty. The figures are too few for generalization, but the percentages of those reacting are lower throughout the earlier years than those of observers in England and America, though the percentage over all ages 47.3 agrees closely, W. A. Brown⁽⁴⁾ giving 47.4 in a similar group. Ten of the patients gave a history of previous scarlet fever and all of these failed to react.

Group V.—Whooping Cough Patients.

Group V. consists of twenty-four patients suffering from whooping cough ranging in ages from four months to nine years. Of these ten yielded reactions, giving a percentage of 41.5. There was nothing of interest in this group apart from the fact that a family of five children, aged three, four, six, seven and nine respectively, all failed to react to the Dick test. I have noticed in several instances that children of one family tend either all to react or all to yield no reaction.

Group VI.—Measles Patients.

The last group consists of sixty-nine patients suffering from measles, who were inoculated with the original Dick toxin. They are included, as they were the last group injected with this toxin and because only isolated cases of measles have occurred in the hospital since they were injected. Of these patients twenty-five gave reactions, a percentage of 36.2. Two patients, aged thirteen and eighteen, gave a previous history of

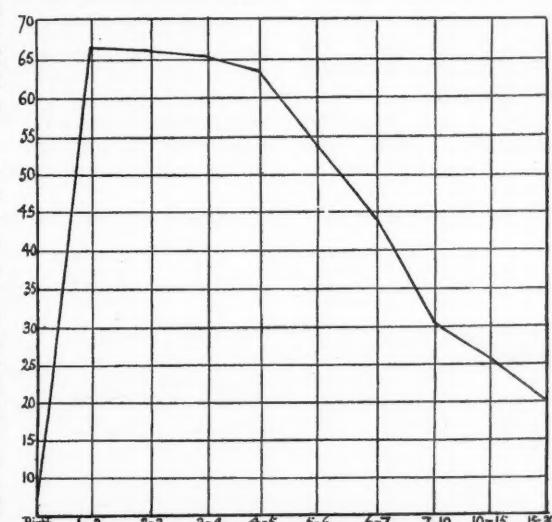
scarlet fever and both failed to react to the Dick test.

Prophylactic Value of Scarlet Fever Antitoxin Serum.

Three months ago a unique opportunity arose of testing the prophylactic value of antitoxic serum owing to outbreaks of scarlet fever in two of the diphtheria wards. The antitoxin was an imported product, described as containing at least 50,000 skin test units to the cubic centimetre, each unit representing the amount of antitoxin that will neutralize one skin test dose. It has been in use for some time in our scarlet fever wards, giving definitely beneficial, though not dramatic results.

In the first ward a child, aged six years, developed a bright rash, vomiting, a temperature of 39.4° C. (103° F.), angina and later joint pains and a peeling tongue. Unfortunately a Schultz-Charlton blanching test was not done and next day a second but milder infection became manifest. In this instance the rash was too evanescent to permit of a Schultz-Charlton test, but the patient gave a response to the Dick test and was seen by Dr. Scholes and the condition was considered by him to be clinically scarlatina.

The cause of the infection was searched for and narrowed down to a child who had been admitted a week previously, having been ill for seven days and presenting a swollen injected throat and a profuse nasal discharge. Since then he has desquamated and developed



an "otitis media. He did not react to the Dick test.

It was decided to submit the children in the ward to the Dick test and of the nineteen children eleven gave reactions. Of those who did not react, two had had scarlet fever previously and one was a child who has been in hospital for years with a retained tracheotomy tube. Those who reacted were all given 2.5 cubic centimetres of antitoxin intramuscularly, the amount recommended for prophylactic immunization by the makers.

Two of those who reacted, had abortive attacks the next day. All these children were retested in forty hours and with one exception all failed to react to the Dick test. The results are set out in Table III.

At the end of the week a further test was made and three of the children gave definite reactions, while another three gave faint reactions. Three days later three of those with definite reactions and one with a faint reaction had abortive attacks of scarlet fever with faint rash and mild rise of temperature. In two of these I was able to demonstrate the rash extinction phenomenon described by Zingher.⁽³⁾ This consists of a white area corresponding to the site of the previous response to the Dick test and surrounded by a slightly intensified ring of rash. Zingher explains this as a local cellular immunity conferred by the intradermal injection of toxin and incidentally diagnostic of scarlet fever. In a second case I noticed the reappearance phenomenon described by W. A. Brown⁽⁴⁾ where on the onset of the rash an area of redness corresponding to the site of the previous Dick reaction appeared. This reaction had completely faded in between the time of the test and the onset of scarlet fever. Of the remaining four children, one went home, one regained her reaction and finally went home without acquiring the disease and the other two failed to react to three weekly retests. The children who had developed scarlet fever, also failed to respond to the Dick test throughout and none of the children who originally gave no reaction, acquired the disease.

In the second diphtheria ward a case of scarlet fever arose which was clinically definite, and furthermore the patient gave a Schultz-Charlton

reaction with convalescent scarlatinal serum and also a Dick reaction. The children in the ward were immediately submitted to the Dick test, seventeen of the twenty-six giving positive results. In this case thirteen of them were given five cubic centimetres of antiscarlet serum and the remaining four patients five cubic centimetres of normal horse serum, as I wished to see whether this neutralized the toxin *in vivo*. At a forty hours retest all the patients who had received antitoxin, failed to react to the Dick test and the four with normal horse serum injections still reacted.

Five days later one of these four children developed scarlet fever and the others were given five cubic centimetres of antitoxin. All these children continued to yield no reaction for two weekly retests, but on the twenty-second day five of them gave faint reactions, the others still failing to react. It will be seen from these figures that at least five cubic centimetres of the antitoxin serum used is necessary to confer passive immunity for a fortnight, 2.5 cubic centimetres being quite useless. Five cubic centimetres apparently protect a child for this period as measured by its immunity to a skin dose of toxin. Therefore prophylactic injections of this amount would possibly be of use in institutional work, provided the source of infection had definitely been run to earth. This is often a matter of some difficulty. They should, however, be valuable in protecting other members of a family when one has acquired the disease.

With regard to the antitoxin used in these experiments, an interesting point has occurred. The serum is of undoubtedly use in treating patients with scarlet fever. Apart from observations made by medical officers, a sister who has been in charge of a scarlet fever ward for years, is emphatic as to its beneficial action. In addition, it neutralizes the specific toxin both *in vitro* and *in vivo* and confers a certain amount of passive immunity. On the other hand, I have been unable in any case to demonstrate with it on a Schultz-Charlton blanching reaction, either in pure state or in any dilution. Similar injections have been made on the same patient with the antitoxic serum pure and with a one in a hundred dilution of the antitoxic horse serum

TABLE III.—SHOWING RESULTS OF INOCULATION OF CHILDREN WHO REACTED TO THE DICK TEST.

| Initials of Child. | Result of First Test. ¹ | Sequel. | Result of Forty Hours Retest. ² | Result of First Weekly Retest. | Sequel. | Result of Second Weekly Retest. | Result of Third Weekly Retest. | Observations. |
|--------------------|------------------------------------|----------------|--|--------------------------------|----------------------------------|---------------------------------|--------------------------------|---------------|
| V.Y. | + | Developed S.F. | Not done | — Faint + Faint + | Developed S.F. Developed S.F. | — + Not done Not done | — — | Went home |
| J.S. | + | | — | + | Developed S.F. | Not done | — | |
| K.O'S. | + | | — | + | Developed S.F. | Not done | — | |
| N.C. | + | | — | ++ | Developed S.F. | Not done | — | |
| W.H. | + | | — | + | Developed S.F. | Not done | — | |
| J.H. | + | | — | ++ | Developed S.F. | Not done | — | |
| V.C. | + | | — | — | | | | |
| R.T. | + | | — | Faint + | | | | |
| L.H. | + | | — | Went home | | | | |
| I. le G. | + | | — | | | | | |
| J.M. | + | Developed S.F. | Not done | — | | | | |

¹ + = reaction; — = no reaction.

² After 2.5 cubic centimetres antitoxin serum.

ILLUSTRATIONS TO THE ARTICLE BY DR. BURTON BRADLEY.

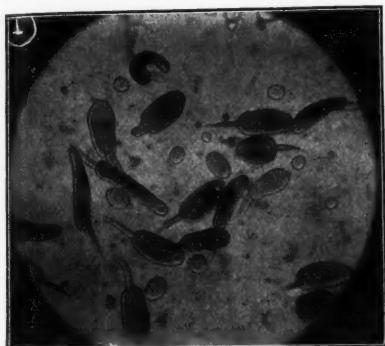


FIGURE I.
Cercaria pellucida n. sp.? Microphotograph.

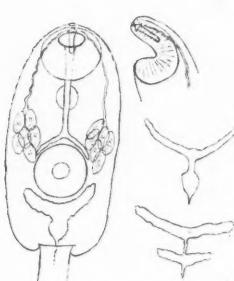


FIGURE II.
Cercaria pellucida n. sp.? Drawing of cercaria body and outlines of bladder in various states of contraction.

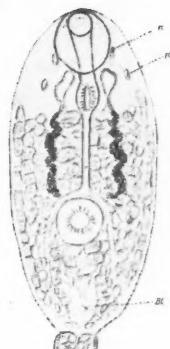


FIGURE III.
Cercaria catella n. sp.? Drawing of body.

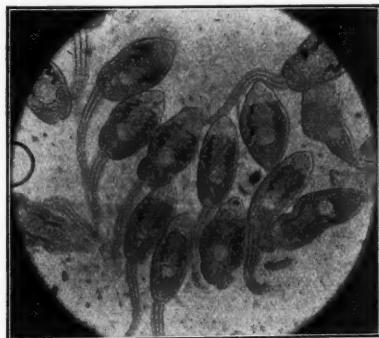


FIGURE IV.
Cercaria catella n. sp.? Microphotograph of cercariae.

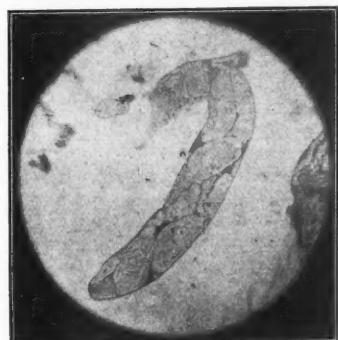


FIGURE V.
Cercaria catella n. sp.? Redia containing cercariae. Microphotograph.

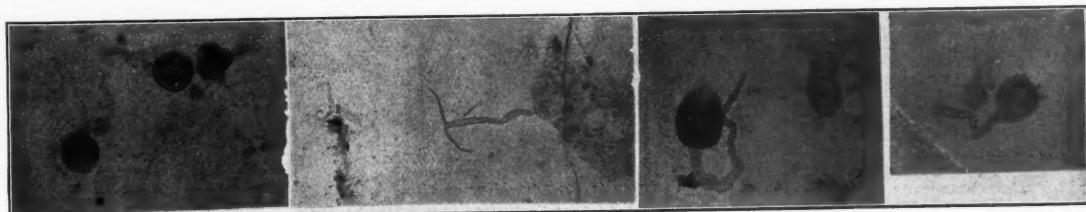


FIGURE VI.
Cercaria catella n. sp. Cysts. Microphotograph.

FIGURE VII.
Cercaria greeri. Microphotograph.

FIGURE XI.
Cercaria pigmentosa. Microphotograph.

FIGURE VIIB.
Cercaria catella n. sp. Cyst forming. Microphotograph.

ILLUSTRATIONS TO THE ARTICLE BY DR. BURTON BRADLEY.

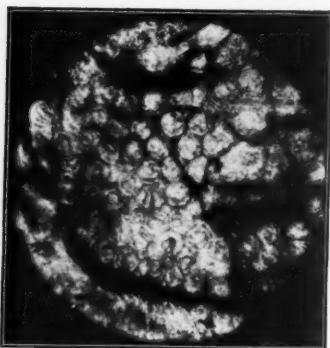


FIGURE VIII.
Cercaria catella n. sp.? Mass of cysts
in *Bulinus brazieri*. Microphotograph.

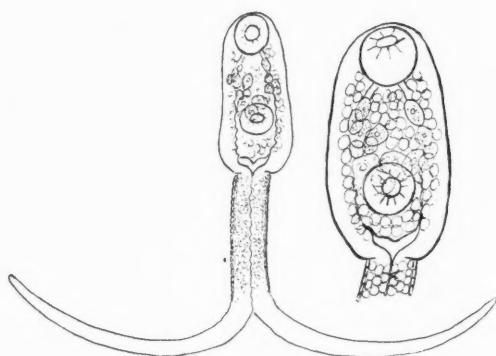


FIGURE IX.
Cercaria greeri n. sp.? Drawing.

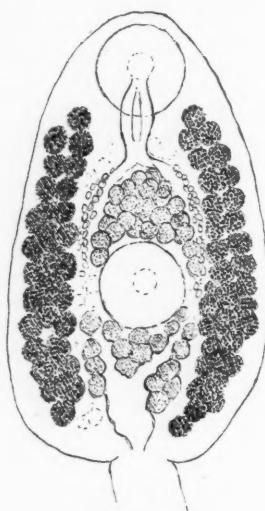


FIGURE X.
Cercaria pigmentosa (? same
as Cawston's). Drawing of
body.

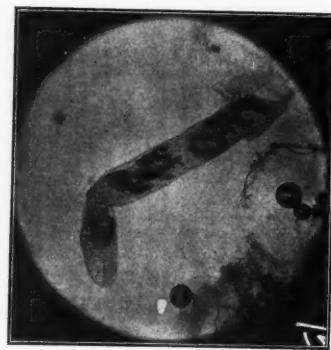


FIGURE XII.
Cercaria pigmentosa. Redia.
Microphotograph.

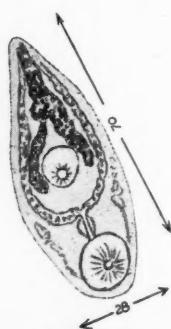


FIGURE XIII.
Cercaria nigrocystica
n. sp.? Drawing.
0.1 millimetre = 10
on scale.

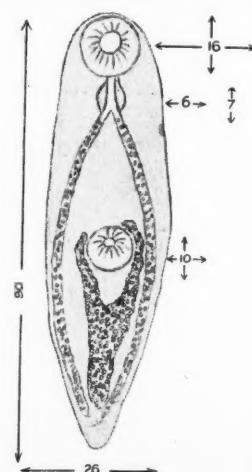


FIGURE XIV.
Cercaria nigrocystica n. sp.?
Drawing. 0.1 millimetre = 10
on scale.

from the strain isolated here, with no result in the former and typical blanching in the latter.

Is this due to loss of potency or is there a possibility that the serum is not quite specific for the type of scarlet fever predominant in Melbourne? It is a question of antitoxin values, but one would imagine that if the antitoxin had so deteriorated that no Schultz-Charlton were given, it would not give the other specific results. At present there is no opportunity of comparing it with other types of antitoxin, so no very definite conclusion can be arrived at, but the question arises, as suggested by O'Brien and Okell,⁽⁵⁾ as to whether there are different strains of the *Streptococcus scarlatinae*—possibly serological types analogous for example to those of the meningococcus. The bulk of scarlatinal infections predominant in Melbourne might fall into one group, whereas the prevailing type of case in America might belong to another. This also possibly might explain those cases in which a persistent Dick reaction occurs for an indefinite period after clinical scarlet fever.

Conclusions.

1. A toxin has been obtained from a haemolytic streptococcus which is apparently specific for the type of scarlet fever prevalent in Melbourne.

2. This toxin, in suitable dose and dilution, gives 92.3% positive results in the first four days of scarlet fever and no reaction in 85.2% of cases after three weeks.

3. Anomalous cases occur and the Dick test appears to be of more value in separating susceptible from non-susceptible children of the community, than for purposes of diagnosis. In no case of those observed has a person not reacting to the Dick test acquired scarlet fever.

4. Of diphtheria convalescent patients tested, susceptibles range from 66.6% to 20% according to age groups.

5. The antitoxin used in the experiments has a definitely beneficial action on the disease.

6. Five cubic centimetres of antitoxin injected intramuscularly confers immunity, as measured by failure to give a skin reaction to the Dick test for at least two weeks.

7. This antitoxin, either pure or in varying dilutions, fails to give a Schultz-Charlton skin blanching reaction.

8. It is to be assumed, therefore, that antitoxin, prepared from the specific toxin of a streptococcus isolated from the type of scarlet fever prevalent in Melbourne, should give most satisfactory results.

Acknowledgments.

In conclusion, I wish to express my thanks to Dr. Admans and Dr. McLorinan for the help they have given me in this work.

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PHYSICAL THERAPEUTICS.

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Of all therapeutic measures practised from earliest times to the present those which may be classed as physical, certain hold pride of place both as regards seniority and usefulness. Because the science is so old and has been universally practised, the various methods finding their way into the medical armamentarium only to be pushed out by new fashions in treatment and later reasserting themselves, it has scarcely ever been looked upon as a definite branch of medical treatment. With the advent of medical electricity, however, there sprang up the cult of the electrologist and on account of the hypocrisy and fraud practised by the greater number of these non-medical practitioners, such methods as they used became universally suspected by the profession. This suspicion and antagonism were inevitable under the circumstances, but were unfortunate, as many very useful procedures were condemned as worthless through the faults of charlatans and quacks. However, this phase has passed or is passing and in place of the unqualified quack there is coming the regular medical practitioner who pays special attention to physical methods in the treatment of disease.

Using the term in its widest sense physiotherapy includes all physical measures taken to secure the comfort and safety of a patient and to initiate or stimulate natural resistance to infection and repair of damage done either by infection or trauma.

There is an important and often overlooked fact which must be stressed, and that is, that generally speaking the method used does good not of itself, but by the stimulation of natural resistance and repair. Sometimes this is not so and natural resistance does not function as, for instance, in the treatment of gonorrhœal cervicitis by diathermy. Here the heat produced in the tissues actually kills the infecting organism.

Every doctor is a physiotherapist to a certain extent in his everyday practice without thinking of it specially. For instance, when he orders a patient to stay in bed the main idea is that, by resting from physical exertion the output of energy is saved and so made available for repair process

of the body as a whole. Any mechanical aid such as a splint comes also within this category. Indeed on consideration it becomes evident that unconsciously he has been not only using physiotherapy all his professional life, but that furthermore it has taken first place. For example in the treatment of acute lobar pneumonia, physical therapeutics include rest in bed, light and ventilation and proper nursing, that is, conserving the patient's energies by allowing him to do none of the energy wasteful acts, such as getting out of bed, raising himself up *et cetera*. When these matters have been arranged satisfactorily and only then does the physician proceed to consider the question of drug treatment, serum or vaccine therapy or any further measures which may appeal to him. Because so commonly and universally used, these everyday physical measures are apt to be regarded scarcely in the light of treatment, but merely as the sort of thing that naturally is done in such a case. It is only when one finds a man with a blue face, grunting respiration and a consolidated lung sitting in the waiting room that one suddenly realizes the supreme importance of fundamental therapeutics. The familiar physical measures, such as those already mentioned, are accepted without question, because we as students have seen them used and come to use them ourselves with scarcely a thought, but we are apt to look askance at others with which we are not familiar but which, once accepted, we would be equally loth to do without. It is valuable to take stock of all such measures and see whether they can be brought to do more in our service, that is in the work of getting our patients well again, than they are doing and whether there is any excuse for the existence of the large and growing body of medical men who specialize in this class of work. The physiotherapist deals first with the principles of appropriate rest and exercise of the whole body or of its various muscular units. The natural corollary of this is muscle education. This in itself is an important branch of work and one but little understood outside the ranks of those interested in orthopaedics. Massage one naturally associates with the foregoing as on the properly trained masseur the actual work of educating muscles *et cetera* must fall. But the masseur should not be the one to say just when and how such measures should be applied, yet the average student of medicine at graduation has seen or heard little of these important methods of treatment and later vaguely orders massage and exercise and leaves it at that.

Heat, applied in various ways, has been valued and made use of in treatment probably for longer than massage and that is saying a lot. It is a most valuable aid in treatment and may be applied in a variety of ways as, for example, in convective heat by means of the old familiar hot poultice or the more modern electric pads. Radiant heat is derived from the sun, the fire, electric radiator or the latest type of lamp either with or without light. A third and most useful of all forms of heat is conversive. This is the heat generated in the tissues

by the passage of high frequency currents in the method known as diathermy.

Light as sunlight is so much accepted, as is also fresh air, as part of the natural surroundings that our forefathers forgot about them altogether for years or rather failed to recognize their importance both from a prophylactic and curative point of view. Indeed light and fresh air are only now coming into their own as recognized therapeutic agents. Finsen in Copenhagen and Rollier by his amazing work in the Swiss Alps have done much to rivet the attention of the world on the therapeutic value of light. In places where the weather is favourable, the atmosphere fairly dry and there is a reasonable amount of freedom from wind, sunlight is the best source of light for general purposes. Where these conditions do not obtain or where it is inconvenient or impossible for patients to get into a quiet place to "sun bake" we have now at our disposal lamps which produce all the rays of the solar spectrum. The value and use of phototherapy is at present only beginning to be understood. But already much remarkable evidence has been offered of the curative effect of light, particularly the ultraviolet rays, in many local and systemic pathological conditions.

Hydrotherapy is nothing new. Indeed from Biblical times and earlier we have accounts of health giving waters. Why then, one may ask, is there such a talk about physiotherapy? Probably the greatest stimulus to the study and use of these remedies was the advent of electricity as applied to medical apparatus. No sooner had the physicists begun to produce apparatus which could be handled by laymen than the fascination of something electrical seized on many and electricity began to be used in and out of season by persons who were but little qualified to do so. Very many interesting results were obtained at various times by chance and so electrical methods became the rage. The unfortunate thing was that medical men, being generally pretty well occupied with their work and having neither time nor inclination for playing with new and unproved electrical methods, this class of work fell into the hands of unqualified and often unscrupulous people. The result has been that the profession has judged the methods or rather the possibilities of the methods by these unqualified practitioners and has decided against them. This antipathy is gradually being overcome by the really magnificent work done in Europe and America by electrotherapists. As before mentioned electricity was a powerful stimulus to physiotherapy, as even the fraudulent methods of charlatans could not blind the medical world for long to the enormous possibilities of electricity in its various uses and thus led to a greater interest and study not only of this, but all the other physical methods. Their proper use in many conditions gave further brilliant results and gradually medical opinion was swung round from antagonism to easy tolerance and from the ranks of the tolerant enthusiasts are being recruited in increasing numbers. Physiotherapy

departments now occupy imposing quarters and deal with increasing numbers of patients in numbers of large hospitals. In order to obtain good and consistent results with physiotherapy every bit as much as with any other form of treatment, it is necessary in the first place to have a correct diagnosis and a clear understanding of the pathological process involved. In the second place it is necessary to have a correct idea as to whether any of our physical methods of treatment will control or rather aid the body to control such process and, if so, which method will do so and how it may be best applied in order to bring about the desired result. Or again whether better results will be obtained by a sequence, for example, massage alone or massage following diathermy or some form of light or heat and light combined. It must be quite clearly understood that good results will not consistently be obtained by haphazard prescribing of one of the methods available. Such loose prescribing has done much in the past to discredit not only electrotherapy, but many another method. Apparently many practitioners have not thought much about physiotherapy until they have had cases in hand which defied their usual formulae and then, having to do something, have ordered at random massage, ionization or very often simply "the battery," knowing little and caring less what sort of battery is used, what sort of current, how and where it is to be applied, for how long, at what intervals *et cetera*. These details have been left too often to the masseur or the nurse, who possibly has no idea of the pathological process he is attempting to influence and very often no idea of what his battery is capable of doing.

These bad days are fortunately passing and more and more is it being recognized that the various physical agents used in treatment must be handled with just as much care as drugs. Not only will they not do good, unless used intelligently, but often serious harm may result from perfectly good methods used unskillfully. Gradually physiotherapy departments have been organized particularly in other parts of the world and naturally it is to an up-to-date hospital that one must look to see methods such as those under consideration used to best advantage. Where there is such a department, it is usually under the control of a "specialist" whose duty is first of all to organize both the personnel and the equipment, to see that his assistants are properly trained and thoroughly understand the work they are to do, and the various pieces of apparatus of which they have control. Secondly, he will see each patient referred to his department. These will have been referred to him for treatment, if he thinks treatment in his department is indicated and by such method as he thinks proper. Patients would not simply be sent for hot air or massage or diathermy by their own doctors, but, accompanied by their history sheets, be referred for treatment. The physiotherapist should have had a fairly extensive experience in general practice and needs to keep his wits about him, as it is easy enough to

accept another's diagnosis, but hard to explain away the fact that perhaps he has been treating a patient with a malignant prostate for sciatica, even though the patient may have been sent with the latter diagnosis. No matter how much one may respect the opinion of a colleague, one is never justified in omitting a thorough examination at the outset.

One or two lessons soon drive home this truth. Having said enough I think to indicate that, granted physical methods are useful, it is necessary for them to be administered by some medical man who has special interest in them, I will briefly outline the main methods we have at our command and indicate their main spheres of usefulness.

Medical Gymnastics, Massage, Muscle Education.

Medical gymnastics, massage and muscle education need little advocacy to establish their usefulness. Their worth has been proved and we all accept them as valuable. All the same it needs skill and care in prescribing and should not be left to the judgement of the masseur.

Hydrotherapy.

Hydrotherapy too is established although with the exception of one or two places, such as Rototua in New Zealand, and Moree in New South Wales, its vogue is nothing like that on the continent of Europe where the spas are numerous and extensively patronized. Although simple measures such as contrast baths may be used in the home, the more elaborate forms of hydrotherapy such as the whirlpool bath *et cetera* can be employed only in a properly equipped department.

Electrotherapy.

It is when we come to the various electrical appliances that there is most vagueness in the thoughts of many and it is towards them that most of the scepticism and even actual antagonism is directed and so I shall devote more space to these. Omitting details of apparatus I will try to indicate briefly what it delivers to the patient and how this initiates or aids already existing repair processes in the human body. Again the point must be stressed that it is not the electricity itself which is expected to be of benefit through some specific action on disease process, as mercury kills the spirochaete, but, either by its power of stimulating weakened body cells to their normal activities or by its use enabling some other factor to be brought into play it benefits the patient. Examples of the latter are ionization where chemical substances are carried into the tissues and in the mercury vapour quartz lamp where the vapour heated to incandescence by the electrical current gives off ultraviolet rays.

Static Electricity.

A static machine is a high voltage self-charging condenser. The passage of the current through the tissues is not followed by the formation of heat or chemical reaction in demonstrable quantity. The

clinical reaction is definite.⁽¹⁾ I have no personal experience of the use of these machines and so far as I know there is not one in use here, but in America physiotherapists are very emphatic about their value, particularly in cases in which there is much congestion of tissue as for example in trauma of joints, certain forms of neuritis and arthritis. In the static current the voltage is extremely high, calculated to be twenty-five kilovolts per inch of spark gap, and the ampérage extremely small. A sixteen plate machine, making five hundred revolutions per minute, gives less than a milliampère of current. The static current is one of high potential and has polarity.⁽²⁾

Galvanism.

The galvanic is also a constant current. It is used in the testing of muscles where certain definite effects as regards contraction are watched for on making or breaking the flow as in testing for the reaction of degeneration. Polarity is of great importance and the use of the negative or positive pole makes all the difference in the results obtained. Therapeutically the most common use of the galvanic current is in electrolysis or ionization. In this process certain chemical substances are broken up and the ions of the various elements are carried into the tissues and are able thus to exert their action on the particular spot aimed at. Where this is superficial as in the case of an indolent ulcer or an infected *cervix uteri*, the object may be attained, but it has been shown⁽³⁾ that penetration by the ions is limited to the skin or mucous membrane and the tissues immediately beneath. Results formerly thought to be due to deep penetration, as in joints *et cetera*, were probably due to reflex effects in the deeper structures from the superficial stimulation—in reality a counterirritation.

Sinusoidal Current.

Sinusoidal current is a galvanic current modified by passing through a constantly and evenly varying resistance which is so constructed that each succeeding wave is of opposite polarity to the preceding one and so polarity effect is done away with. This particular current has been largely used for the purpose of keeping muscles in good condition by stimulating them to contraction in cases of peripheral nerve injuries during the period which must elapse, during regeneration until normal stimulation to contraction can take place. The sinusoidal current is owing to the painless nature of its stimulation, the lack of polarity effects and the slowness of its impulses thought of very highly by physiotherapists who have used it to any large extent.^{(3) (4)} These workers lay great stress on the importance of proper technique and point out the danger of overstimulation of muscle under these conditions. Royle,⁽⁵⁾ however, in a series of prolonged experiments with rabbits could find no evidence of benefit as regards final recovery of muscle after nerve division from the use of any electrical method used as an aid to recovery. It is only fair, however, to draw attention to the fact that in these

experiments the parallelism between animals and the human subject is doubtful. The one thing certain is that active muscular movement is the best help to recovery of full functional activity and the only point at which electrical stimulation is likely to be of any assistance is during that period between the injury to the nerve and until regeneration has taken place sufficiently for a normal stimulus to reach the muscle.

Faradism.

The faradic current and its modification by Bristow are induced currents alternating and so have no polarity. In stimulating muscle the contraction is produced by conduction through the nerve, that is, by the normal path. In reaction of degeneration this response is the first to go and the last to reappear. As this is so, it will be seen that its use in this respect is limited and has largely been replaced by the sinusoidal.

Diathermy.

Whatever opinions may be held as to the value of the foregoing, there can be no doubt as to that of high frequency currents in suitable conditions. There are two main methods of employing current from a high frequency machine, the monopolar, using a current of high voltage and low ampérage (the Oudin current) and the bipolar method or diathermy in which the current is of relatively lower voltage and higher ampérage (the d'Arsonval current). So much has been written of late about diathermy and so many firms have good reliable machines on the market, that it is unnecessary to attempt to describe the principles on which they operate. In the bipolar method the two poles of the machine are connected to the body electrodes which are usually flexible metal plates (twenty-two gauge foil is the most satisfactory) which are selected as to size and shape according to the part under treatment and the effect desired. When the current is passing, owing to its high frequency, there is no electrical sensation. The resistance of the tissues converts the electrical energy into heat through the path of the current. This is the main effect aimed at and by it, that is, by heat produced in the tissues themselves or "conversive heat," any effect which may result, is brought about. If the two electrodes are of equal size and the tissue included between them is of equal density throughout, then the heating should be evenly distributed from plate to plate. If, however, the tissues are not of equal density, then those offering most resistance to the current will have their temperature raised to a greater degree than the less resistant. This is a point of practical importance, as frequently a scar will be included and owing to its density and lack of blood supply will develop a greater heat than surrounding parts and if this fact is not allowed for, some tissue necrosis may result. If the electrodes applied to the body surface are not of equal size, then the greater development of heat will take place under the smaller. This fact is made

use of in many ways and by reducing the size of one electrode to a point, the effect of tissue destruction or coagulation may be produced and is used thus in surgical diathermy or "endotherapy." What is known as indirect diathermy or "autocondensation" is a method of using the d'Arsonval current shortly as follows: One pole of the machine is connected to an autocondensation pad or chair. This is in effect a large electrode covered with some insulating material. On top of the insulating material the patient sits or lies and is connected to the other pole of the machine generally by means of a metal handle which he grasps with both hands. When the machine is switched on, what happens is that actually the patient is used as one plate of a condenser, the other of which is the large electrode in the mattress from which he is separated by the insulation. He is alternately charged and discharged synchronously with the condenser of the machine. Clinically there is a rise of body temperature with some acceleration of the pulse and fall of blood pressure when this is high. It is useful in cases of hypertension, particularly in highly nervous individuals with insomnia. The effect is apparently very soothing as the patient often seems loth to get up from the couch and usually at least one night's good sleep follows each treatment.

The monopolar use of the high frequency current is used mainly as a counterirritant in "medical" as distinguished from "surgical" high frequency. By means of a glass vacuum electrode or a metal lined non-vacuum one a shower of sparks may be sprayed on to a patient. The therapeutic toys so commonly used by masseurs and hair dressers under the caption "violet ray" are small high frequency machines using a monopolar discharge. It should be noted that the usual demonstration of cooking a piece of steak or coagulating some egg albumin, although it shows the actual method in which the diathermy current heats the tissues, is still not an accurate illustration, as there is this great difference: In the living subject there is the circulation to modify the effect. It does this very effectively, otherwise medical diathermy would be too dangerous to be justifiable. Very often, however, as before mentioned, there may be dense scar tissue with a minimum of circulating blood under one or other electrode and this fact must be borne in mind in estimating dosage. The indications for the use of diathermy, omitting the surgical application, are generally speaking those conditions in which it is thought that heat and an increased blood supply to the part are desirable. In a previous communication⁽⁶⁾ I have reported some results in the treatment of certain chronic conditions. One condition in which diathermy is very useful, is the disability following septic or crush injuries of the hands and feet. These sequelæ, tiresome and resistant for a long period under any circumstances, are certainly helped very greatly when diathermy is added to the physical measures usually employed, that is, radiant heat, active and passive movements and massage.

A comparatively recent use of diathermy of which so far I have no experience, is that so enthusiastically advocated by Stewart.⁽⁷⁾ He reports a series of cases of lobar pneumonia in which diathermy was added to the routine methods of treatment in the hospital. He places electrodes about 17.5 by 10.0 centimetres (seven by four inches) back and front as nearly as possible to include the consolidated area between them. Treatments are given one a day up to every four hours, lasting about twenty minutes according to the patient's condition. Although not enough work has been done to justify a claim for a definite reduction of mortality, he states that the course of the disease is altered in so far as the temperature begins to fall and continues to do so by lysis, that the general condition of the patient is rendered much more comfortable and all the distressing symptoms greatly alleviated with each treatment. He considers that diathermy, if used as soon as a diagnosis of lobar pneumonia is made, does definitely render the disease much less distressing to the patient and in his series the mortality was definitely lower than in the controls who were patients approximately of the same type as those treated. This was possible as the method was tried in the United States Marine Hospital and the patients all sailors. It would appear that this method is worthy of a thorough trial in one of our large hospitals where the results could be easily compared with those of patients treated without diathermy.

Still another special use of diathermy is in the treatment of gonococcal infection. This is based on the fact that the gonococcus is destroyed readily by heat. By the use of specially designed electrodes it is possible to destroy them in the tissues without injury to the tissues themselves. It is not so successful in acute cases, particularly in the male, as in chronic infections of the prostate and seminal vesicles in the male and the cervix in the female.^{(8) (9)} Cumberbatch and Robinson have employed this method largely in gonorrhœal rheumatism, treating the joints as well as the cervix *et cetera* or leaving the joints untreated and directing their attention wholly to the spot where infection lies. They concluded that the joint treatment is often quite unnecessary, the disseminated manifestations of infection frequently clearing up as soon as the focus in the cervix or vesicle is cured. Non-specific cervicitis does not respond so well to diathermy as to ionization by means of a copper sound introduced in the cervical canal and used as an electrode.⁽¹⁰⁾

Heliotherapy.

Sunlight has been accepted as part of our ordinary surroundings so much that it has been often forgotten not only in the treatment of disease, but even as a necessity for healthy existence. This is proved abundantly by the hideous examples of schools, factories, dwellings and even hospitals with which everyone is familiar if not from personal experience at any rate by report. These are happily

being replaced by those in which modern principles as regards light and ventilation have made a free supply of these necessities available. But though it was recognized that sunlight is necessary to both plants and animals, it was Rollier who in 1903 opened at Leysin in the Swiss Alps the first clinic for the systematic application of sunlight for bone tuberculosis and focussed the attention of the medical world on the curative value of light in disease. The reports of those who have visited his clinic and the account of his work and results in his book published in 1923,⁽¹¹⁾ sound almost like fairy tales. Though Rollier's work focussed attention on heliotherapy, a good deal had been previously done by Finsen, of Copenhagen, who in 1893 began treating lupus by sunlight. He recognized that it was the ultraviolet part of the solar spectrum that produced the good effects and as sunlight was scarce and not very strong, he developed the lamp which bears his name. I believe, however, that the very earliest attempt to use climatic influences systematically is to be placed to the credit of Dr. Russells, who in 1750 established at Margate a sanatorium for scrofulous and tuberculous children.⁽¹²⁾

Physiologists explain the how and the wherefore of these results and physicists bring the possibility of reproducing some of them to our hands through the agency of the various lamps producing light more or less rich in the ultraviolet rays which are most useful therapeutically. It would seem absurd to need a lamp to produce artificial sunlight in a country such as ours, where we are blessed with such a glorious climate. But even here, particularly in winter, we have many dull days and even when the weather is suitable it is often difficult to expose the patient to the sun's rays. Again in low lying situations where the humidity is fairly high and in cities where the atmosphere carries a large amount of smoke and dust, most of the ultraviolet rays are absorbed before they reach us. The various forms of radiant energy have each a different wave length, from the very long Hertzian waves at one end of the spectrum down through the infrared or heat waves, those of the visible spectrum, the ultraviolet, the X rays to those of still shorter wave length which emanate from radium. Each of these varies in its power of penetration of various substances. The Hertzian waves for example pass through the body without absorption. The infrared are absorbed more and become converted in the process into heat. Absorption increases as we pass down the visible spectrum until we come to the ultraviolet, where at about 3,000 Ångström units it becomes practically complete in the superficial layers of the skin.⁽¹³⁾ The absorption of these ultraviolet rays by the skin sets up certain reactions which are as yet not very definitely understood. According to the amount and quality of the ray absorbed reactions vary from a slight erythema to an intense scarlet colouration with blistering as in sunburn. In rickets ultraviolet light is a specific. It was found that rats which were the subject of rickets, experimentally produced by variations in feeding, could be cured by

short daily exposures under the ultraviolet lamp. A further strange fact was noted, namely, that when the food, although deficient in the antirachitic factor was exposed to ultraviolet light for certain periods and then given to the animals, it had the same curative effect as exposure of the animals themselves. The ultraviolet region of the spectrum has been divided into what are known as the "near" and "far" ultraviolet, as the effect of the radiations predominant in one or other rays vary in their effects when used therapeutically. The "near" are relatively more penetrating and have a more stimulating effect on the organism as a whole, while the "far" are completely absorbed at the surface and have a greater superficial or bactericidal effect.⁽¹⁴⁾ The lamps which produce these ultraviolet radiations, are of two classes, (a) the mercury vapour in a fused quartz tube and (b) the carbon, carbon filled or tungsten, arc. They appear to produce equally good results. For clinical use the dosage is worked out according to the voltage across the burner, tube skin distance and time of application. The indications for use, as may be easily imagined, are very many. It is specific in rickets and is useful in many asthenic conditions. In places like London, where sunlight is at a premium, it has been largely used during the convalescence from debilitating conditions such as influenza.⁽¹⁴⁾ Seeing that in rickets the calcium and phosphorus metabolism is involved and the response is so good, one would expect good results in delayed union of fractures. This expectation has been justified in many cases reported. Chronic ulcers from various causes are stimulated to healing in a remarkable manner. These are examples of a few of the conditions benefiting by exposure to the ultraviolet lamp. The pain of neuritis is often promptly relieved and in conjunction with diathermy is most useful in the treatment of this and similar painful states.

X Rays and Radium.

X rays and radium are mentioned only to remember them in the list of physical methods. They are familiar to all not in the actual administration perhaps, but in the knowledge of what can be done by their aid. With these agents more than with any of the others mentioned is the care and skill of the expert necessary to avoid untoward results.

Conclusion.

I have tried to convey an idea of what the modern conception of physiotherapy is. With the various therapeutic agencies mentioned it will be seen that there are very many conditions in which convalescence can be helped enormously. Some of these methods can be carried out in the patient's home without much difficulty in the way of devising apparatus from the many electrical household appliances available. An ordinary radiator for instance will be found of the greatest comfort in the case of fibrositis or in the even more painful state of thrombosed piles. For the use of the more elaborate apparatus, such as the diathermy

machine or one of the therapy lamps, the patient will have to travel to the treatment room either of a practitioner or of one of the hospitals and it is in the latter places where the greatest benefit should be produced both to the patients and to the institution.

Indeed for a hospital to be equipped as a modern hospital should, a department of physiotherapy fully staffed and equipped is essential. Here it will be found, if experience elsewhere can serve as a guide, that patients from all departments in the hospital will be sent in ever increasing numbers. Students will here receive a proper appreciation of the value of such methods and not until this happens will the unqualified practitioner be driven from the field.

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Reports of Cases.

CONJUGAL INSANITY.

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THE following cases may be of interest both by reason of the rarity of conjugal mental disorder and also on account of the medico-legal points involved.

A.T. and C.T., husband and wife, were admitted to the Mental Hospital, Orange, on the night of May 18, 1926. In the waiting room the wife sat singing in a loud voice of her great happiness mingled with snatches of hymns. The husband sat with his eyes tightly closed and did not speak. When asked to walk he did so, but staggered slightly. It was stated that a man C.M. was on remand charged with committing rape on the female patient while she was under hypnotic or some other influence. This was the result of a statement made by the wife when she fled from her home to that of a neighbour's two days before.

On the next day the wife was noisy, talking volubly but coherently on religious matters. She was abusive, inclined to violence and at first refused her food saying it was poisoned. Under sedative treatment she quietened down and two days later was able to give a more or less connected history of her illness.

Meanwhile the husband had first been confused and restless and faulty in habits. Later he was suspicious of his food and was unable to retain what he ate. His statements were rambling and incoherent and contained among other things the statement that he had the power of changing from a man to a woman and that he was the scum of the country. He stated that two days before he had had a vision of the Saviour who had given him great power and that he had just had a vision of his tongue burning in hell. During the course of the same day he had two more visions. In the first he saw himself drinking dry an enormous river and in the second he ate alone a ton of apples. He had one more vision on the next day when he saw himself possessed of great sexual power and surrounded by beautiful women.

On the following day he was able to give a coherent account of his symptoms without interruptions by his visions. This was on the third day after admission and coincided with the onset of accessibility of the wife.

A short record of the personal history of each patient will be given before the onset of symptoms is described. In addition to the patients themselves, relatives and friends and Dr. H. Peet, of Gilgandra, who were acquainted with both patients before their illness, have contributed to this history.

There is a history of epilepsy in the husband's mother, but the remainder of his family history is clear. He is the fourth of a family of ten and had had only one illness during his life, namely measles at the age of five. He had only three years of schooling and was an indifferent scholar. On leaving school he did farm work for ten years and then went to Portland where he worked in the cement works for three years. He married, changing his religion to do so. He has never had any religious differences with his wife. He knew his wife for two and a half years before marriage. After marriage he put in five years at farm work and then travelled for two years in the Mudgee district as an expert in farm machinery. He gave this up because of his frequent absences from home. One year ago he took up share farming and has been successful at this. He is reported by his neighbours as being a good husband, industrious, honest and quiet, of good habits and generally respected. He has had no financial worry, is a teetotaller and only a moderate smoker. He is in perfect physical health. The blood fails to yield a reaction to the Wassermann test.

The wife, C.T., gives a family history of malignant disease on the maternal side; both her mother and grandmother died of a tumour. The present generation are healthy, but the girls are "nervy." The patient is a twin and her twin brother is apparently mentally stable. She was very delicate during her girlhood. She had six years' schooling, but was always a poor scholar. On leaving school she remained at home with her mother with the exception of one year at service. She can read and write, but not well. Her mother died in 1910 after a long illness and at this time she ran round the house screaming for three days. She became irritable at times and would laugh or cry immoderately for trivial reasons. In 1913 she had typhoid fever and was peculiar after this for some time. In 1914 she married and during the honeymoon had two fits of screaming and crying, the ostensible reason being that she did not like her surroundings. Her husband can recollect only one quarrel, in which she threw herself on to the floor with a baby in her arms and screamed. She was put to bed and remained rigid and mute for some hours. Her relatives recognized the hysterical element and have always realized it was easier to give her her own way to avoid trouble. Her brother volunteers the statement that she always took more notice of strangers than of her own people. He also states that the husband is quick tempered. On one occasion after a trivial difference with her sister she took a knife to bed with her and when this was discovered later, she said she had thought of killing her sister for crossing her. On another occasion she had a violent fit of laughing and crying when her husband jokingly disparaged her cooking and again when her husband had rheumatism she became quite unable to carry on with her work. She has five children living. Twelve months ago she lost a boy, aged ten and a half months, from pneumonia and has never thoroughly

recovered from the shock. In addition she has for some few years past suffered from backache and dysmenorrhœa. Physically she is thin and rather pale. She has a retroversion of the uterus and a commencing prolapse. Otherwise there is nothing physically abnormal. The blood does not react to the Wassermann test.

The history of their present illness was compiled from the statements of both made without the knowledge of the other and each account tallies with the other, although the statements of the wife are not so full, her memory for dates and minor events is defective and she seems still impressed with the power and personality of the arrested man.

From the personal history it is safe to assume that the husband was performing well the duties of life and was efficient in his environment. On the other hand the wife was definitely unstable and eminently suggestible. Further she was in a state of chronic ill-health, real or imaginary, and was just beginning to recover from the shock of her bereavement.

The third party in the case, C.M., came into the picture on May 9, nine days before the admission of the patients, when he rode up to the patients' house and requested to be allowed to stay the night as his horse was tired. There being no accommodation in the house, M. was told that he must sleep in the shed. Both husband and wife were so impressed with his eloquence and knowledge that they stayed up talking till 3 a.m. The wife pictures him as a tall, thin-featured man of middle age with "pretty blue eyes." M. told the wife that he could see she was suffering from womb trouble and offered to cure her and on the next day he made a vaginal examination in the presence of the husband.

It was arranged that the husband was to go to town on the Monday and procure a douche and also to take a prescription to the chemist's. The first three days of the week were wet and it was not till the Thursday that the husband was able to get to town. An essential part of the treatment was that the husband was to have nothing to do with his wife for three weeks and the sleeping arrangements were so altered that M. occupied the main bedroom with the wife and the husband slept in the next room.

The husband states that he did not resist this arrangement on the ground that his wife's health might benefit by treatment. He thought in his own mind that something was wrong and that the altered domestic arrangements were unnecessary.

The new arrangements came into force on the night of Friday, May 14, 1926, and the husband decided to lie awake and watch events. A light was burning in the room occupied by the wife and M.

At about 1 a.m. the wife screamed and the husband went in to her. She said she had had a beautiful dream, had been to heaven and seen the baby who was dead. She had spoken thus twice before since the child's death. He stayed with her for one hour and succeeded in calming her. During this time M. remained in the room, but apparently said and did nothing. The husband then returned to bed and remained awake watching the inner room.

On the next day, Saturday, the husband was away for a few hours in the afternoon and the wife admits that she allowed M. to have intercourse with her during this time.

Late that night M. told him to have a smoke to soothe his nerves. For the next half-hour the husband and wife were talking together and then the husband looked for his tobacco tin. M. had had access to this tin during the last half-hour. He rolled a cigarette and smoked it. He noticed nothing peculiar about the flavour, but a desire was aroused in him to smoke more. This was contrary to his usual habit. He smoked rapidly and swallowed the fourth cigarette. From fifteen to thirty minutes after he had smoked the first cigarette he "went into a trance." There seemed to be a tremendous pressure on him and he could scarcely breathe. He heard music playing and saw thousands of people walking about happily "like a show-ground." He saw the Saviour who told him to confess all his sins and He would forgive him. He saw all his past life and his father appeared before him.

About one hour later he thinks he recovered and went in and told his wife about the trance. She told him he

must be going mad. M. was in the room at the time, but did not enter into the conversation. The wife says her husband put his arms round M.'s neck and called him Jesus.

Next day the husband had a bad headache and at about 4 p.m. M. handed the wife a cup of tea which she gave to her husband and told him to drink it down. The husband did so. He said that a power seemed to have come to his wife and she could make him do anything she wished. He can remember nothing further until a neighbour came four hours later, but remembers that he was undressed. At this point there was a gap. He remembers being taken away by some neighbours in handcuffs.

His wife fills up this gap as follows: The husband was strange all that day, singing and dancing all the morning. He threw the dinner of meat in the fire, saying that all were to have dry bread and butter. She does not remember M. giving her husband a cup of tea, but says that she herself was very happy and felt as if she had great power. The husband at this stage became very lustful and shortly afterwards M. sent to a neighbour for help.

When the neighbour came both husband and wife tried to make him obey their commands but, of course, could not. M. said he would go for more help and saddled his horse and rode away. He was not seen again till his arrest next day. The neighbour went home and two hours later the wife ran up to his house in a semidead state. She had spent the time walking round the house with her husband looking for "light," while he raved on religious matters. He said that one of the children was to die and that they would all be in heaven soon. He told his wife that he was going to confine her and bring her dead baby back again. He then became excessively lustful again. Later she escaped from him and ran to a neighbour's home.

With the assistance of the police the pair were removed to town where next day an amateur hypnotist attempted to restore them to their senses, but without avail. This was done under the belief that they had been hypnotized by M. During this day the outstanding features in the husband's case were the overwhelming sexual mania and attacks of severe trembling of the upper part of the body. The wife was violent and noisy at times and her delusions were very pronounced. She spoke of nothing but the great power of the man M.

On the next day the husband was able to recognize the local practitioner and to engage in fairly rational conversation. He asked what was the matter with him and said he felt as if there was a great cloud in front of him and also that the earth was on top of him and if only he could get this off he would be all right. He asked how long he had been ill and when told it was about three days, he said he felt as if he had been "gone" for years. There was no exaltation and no feeling of happiness, but rather the opposite, a feeling of something tremendously wrong. There were no signs of alcohol and no staggering gait. On the same day the wife was still noisy and ascribed miraculous powers to the man M. Late on this date they were admitted to the Mental Hospital, Orange.

Their progress was an uneventful one towards recovery.

Up till the date of their discharge on June 26, 1926, the husband had not recovered the memories of current events at the immediate onset of his illness and the wife had only confused memories of her early life which were largely supplied by her relatives.

The wife, it is safe to assume, has always been of the neurotic temperament, easily roused to laughter and tears and to use the words of her own relatives "always took more notice of strangers." This circumstance rendered her a fitting subject to accept the prestige suggestion of conversationalist. It is only in this manner that we can explain her readiness to speak on intimate matters with a perfect stranger and allow him to act as he did.

The case of the husband is far more difficult to explain. Much evidence was adduced to show that nothing abnormal in his conduct was noted until the arrival of the stranger. This evidence is both lay and medical. He stated that his attitude to the treatment was one of watchfulness and suspicion, but he assented for his wife's sake.

The important medico-legal question arises. Was he drugged and if so, by what?

The overwhelming sexual mania and the occurrence of "trances" following the smoking of a cigarette and the drinking of tea support the theory of drugging.

The sexual trend at the height of the attack brought to mind two drugs, cantharides and *cannabis indica*.

As to cantharides it may be stated that a dose of such a strength as to cause a sexual mania would hardly be unattended by secondary effects of the drug during the process of excretion. There were never at any time any urinary symptoms and repeated tests for cantharides by the blistering test yielded no result. Here it must be stated that the first test for any drug in the urine could not be performed until four days after it could have been administered.

Poisoning by *cannabis indica* cannot be readily excluded. It is true that it was never detected in the urine, but several of the symptoms are in harmony with those of poisoning by this drug. They are: (i.) The sexual stimulation; (ii.) hallucinations of sight where everything is on a grand scale and the subject is possessed of great power; (iii.) the disorder of the time sense so that an illness of a few days seemed to have lasted years. This was considered by Warnock⁽¹⁾ to be diagnostic of poisoning by this drug.

From another point of view what would be the motive of the accused in drugging the husband? I think the only feasible explanation is that the husband's vigilance was becoming irksome and it became necessary to "put him out of action." Of the two drugs under suspicion the use of cantharides is known even by laymen to be not unattended by danger, while it is a stimulant of sexual desire. On the other hand *cannabis indica* with its late soporific effect and its less known early pleasurable effect would be more likely to be chosen, were it available.

Acknowledgment.

I am indebted to the Inspector-General of Mental Hospitals for permission to publish these cases.

Reference.

(1) Warnock: *Journal of Mental Science*, January, 1903.

GANGRENE OF THE FOOT IN A CHILD.

By M. J. PLOMLEY, M.B., Ch.M. (Sydney),
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Children, Camperdown, Sydney.

K.M., aged four years, was admitted to hospital on April 2, 1926, with a history of illness for one day. There were present the usual signs and symptoms of a severe toxic pneumonia of the right side. The child remained very ill and irritable until April 16, 1926, when the temperature dropped to normal, though the respiration remained rapid (forty to fifty). On this day the left foot was noticed to be tender and discoloured from ankle to toes, purplish, mottled and cold. There was also some discolouration on both hands which passed off in forty-eight hours. The pulse could be felt in the popliteal space, but not in the posterior tibial artery at the ankle. No embolus was felt in the vein. A left sided pneumonia now appeared. On April 19, 1926, ten cubic centimetres of straw coloured fluid were aspirated from the right side, and on May 13, 1926, during exploratory needling of this side a small abscess was coughed up. After this the general condition rapidly improved and the child on discharge (June 24, 1926) was rosy, fat and well.

The left foot went through the various stages of dry gangrene. At the time of discharge all the toes were gangrenous and there was a large triangular slough on the margin and sole of the foot, about its middle. Since then several of the toes have dropped off, but the big toe and the large slough have not yet separated. It is too early yet to say to what extent walking will be affected.

The interest of this case lies in its rarity, in the age of the child, in the apparent coincident implication of both hands in the first twenty-four hours and in the recovery of the child after double pneumonia, empyema and gangrene. In the "Medical Annual" for 1926 (page 466) A. Rendle Short refers to three or four cases of massive arterial thrombosis occurring as a sequel to pneumonia all in middle aged people, affecting the upper extremity. Early operation was performed in one of these cases to remove the clot, but gangrene was not averted. Amputation below the elbow followed in all.

I can find no mention of this complication of lobar pneumonia in young children.

STREPTOCOCCAL PERITONITIS IN A BABY THREE WEEKS OLD.

By HILDA E. KINCAID, D.Sc., M.B., B.S. (Melbourne),
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Hospital for Infants, Sydney.

A BABY, three weeks old, was admitted on November 25, 1925. The mother gave a history that the baby had suffered from flatulence since birth and had occasional "blue turns"; but she had not noticed anything else abnormal till that morning when the abdomen became distended. Bowels had been open three times that morning and urine was passed just before admission.

On admission the baby looked very ill; the temperature was 37.2° C. (99° F.), the pulse rate was 148 and the respiratory rate 48 in the minute. The throat, heart and lungs were normal. The abdomen was very distended and tympanitic with some movable dullness in the flanks most noticeable in the right. There was no rigidity. The umbilicus was a little reddened and moist.

The distension could not be relieved by washing out the stomach, by washing out the bowel, by "Pituitrin," stupes *et cetera*. The baby was regarded by the surgeon as too ill to attempt any operative procedure.

The child died on November 27, 1925.

Post mortem examination showed several ounces of turbid fluid (not offensive) in the abdomen. The omentum was wrapped round the *ligamentum teres* and in this region and extending up towards the liver, the pus was thicker and early organization had taken place on the surface of the liver just above the margin of the right lobe. This area was about four centimetres in diameter. The liver was enlarged. The spleen was soft and pulpy. The kidneys showed cloudy swelling. The heart and lungs were normal.

Smears of the pus obtained from the abdominal cavity contained numerous streptococci.

Reviews.

THE NERVOUS DISEASES OF CHILDHOOD.

MORE than twenty years ago Dr. B. Sachs wrote a book on the nervous diseases of children which went into two editions and now, in collaboration with Dr. Louis Hausman, he publishes an entirely new work entitled "Nervous and Mental Disorders from Birth Through Adolescence."¹

The subject is comprehensive and there is a definite need for a further textbook on the lines indicated by the title, but though the present authors have brought together in an easily assimilable form much useful information, criticism cannot be entirely laudatory. It should have been possible within 861 pages to have given more information concerning the child.

The authors might have presumed either that the readers knew more of the rudiments of nervous diseases

¹ "Nervous and Mental Disorders from Birth Through Adolescence" by B. Sachs, M.D., and Louis Hausman, M.D.: 1926. New York: Paul B. Hoeber, Incorporated. Royal 8vo, pp. 877, with illustrations. Price: \$10.00 net.

in the adult or that they could refresh their knowledge at another source. This kind of overlapping in various textbooks is a necessary evil, but at least some of it might have been avoided without great difficulty in this case. In connexion with space saving, it might well be asked: "Why print a very incomplete bibliography in large type?" Surely it would be better to make it more complete, even if the references had to be abbreviated.

None the less the book is worthy of a place on the medical practitioner's shelf, largely on account of the open minded manner in which the topics are discussed. That the work of the late John Irvine Hunter on the sympathetic nervous system is noted will serve to show its up-to-date nature.

Part I. concerns the structure of the nervous system and methods of examination; in Part II. the authors deal with organic diseases of the nervous system. In the next there are several chapters on functional and toxic diseases. Part IV. deals with the endocrine disorders and the last is reserved for mental conditions.

The chapter on the normal child, the normal youth *et cetera* was written to express the strong personal opinion of Dr. Sachs and is based on many years' experience.

Whilst admitting that psycho-analysis has a scientific utility, he registers a strong protest against too much Freudism in the treatment of school children and indeed criticizes very adversely the whole fabric of "Freudian unconscious."

The personal responsibility of parents is rightly emphasized and it is pointed out that negligence in this respect is often productive of serious mental disorder.

There are very few errors in typography, but the authors on page 800 add to the collection of interesting slips of the pen by saying that White's theories of the manic-depressive psychosis "makes interesting reading, but it does not seem to promote a true understanding of the mental process." Although at first sight the use of the word "mad" might appear to be subconscious criticism of the psycho-analytic school by the collaborators, it is just as probable that it expresses the private opinion of the compositor on the tongue twisters of technical literature or is a mere coincidence.

BACTERIOLOGY.

"GENERAL Systematic Bacteriology," by R. E. Buchanan is the first of a series of monographs published under the auspices of the Society of American Bacteriologists.¹ This body is working to place bacteriology amongst the exact sciences and as the word "science" means a system of classified knowledge the value of such work is of incalculable benefit to the study of bacteriology.

The phylogeny and the relationships of various groups of bacteria are traced and compared; a system of nomenclature is recommended and the variations in names borne by the same group or by individual members of that group are discussed both as to merits and faults. Every opportunity is given to independent workers to accept or refute the recommendation advised as the "pros and cons" are set out and supported from the literature. In short, the results of this painstaking research are offered to the consideration of bacteriologists in the hope that they may lead to sufficient uniformity of method in future to rescue the science of bacteriology from becoming a mere chaos of words.

Bacteriology is considered and rightly so not as the province of the medical world alone, but as the sphere of the pathologist, the hygienist, the brewer, the chemist and the botanist. At present each of these groups of workers regards the organism as an object to be named for reference, because it causes certain changes in tissues, plants and in other media which are of particular interest in their special work; hence the chaos in nomenclature which the author is endeavouring to correct.

¹ "General Systematic Bacteriology," by R. E. Buchanan, Ph.D.; 1925. Baltimore: Williams and Wilkins Company. Royal 8vo., pp. 597. Price: \$6.00 net.

The monograph under discussion is divided into three long chapters and these chapters each into numerous sub-headings.

Chapter One deals with the classification of the genera and higher groups of bacteria with a brief history of the various classifications proposed from 1773 up to the present time. Fifty-four schemes are considered and tabulated with their merits and faults up to the year 1923, when the classification according to Bergey and others appeared. Dichotomous keys have been given to most of the genera and higher groups recognized by the various writers.

The author has delved into this forgotten and ignored literature and tabulates the work done in the hope that it will help to clear the way for the development of a stable bacteriological nomenclature. The final classification recommended is that which appeared in 1917 in the "Preliminary Report of the Committee of the Society of American Bacteriologists on Characterization and Classification of Bacterial Types" (Winslow, Broadhurst, Buchanan, Krumwiede and Smith). In this report were given an historical review of systems of classification and a review of the points found in the International Botanical Code of principal interest to bacteriologists.

As a sequence to the phylogeny given in the first chapter, the second deals with nomenclature based on that classification. The validity and suitability of names, already applied to groups and individuals of each group, are fully discussed.

In this regard the International Botanical Code is epitomized and given as an adequate basis which with some modification the author hopes may prove satisfactory as a guide.

Chapter Three is in essence a dictionary of bacteriological names. Names which have been applied in the past, and those now being applied in different countries are alphabetically arranged. A very comprehensive study of the literature has been made and from a bibliography of over three hundred books and monographs by authors of international repute the compiler has quoted the original description of the subgenus and genus of higher group respectively.

The descriptions used by various subsequent writers are discussed and ample data are included under each heading to make possible the formation of an opinion as to the nomenclatural status of each name. This plan should obviate the necessity for the introduction of new names where the older names are valid and in this volume alone has evidence been given to enable the observer to judge for himself. The "Section of Bibliography" is obviously carefully prepared and is very complete. In twenty-seven pages there is a closely printed list of authors' names, the book or monograph of each and the date of its publication.

The author index is equally complete and comprises every person of note who has worked in this field.

To the really interested worker in bacteriology these indices alone supply a long felt need.

The monograph on the whole is a boon to the bacteriological world.

OPHTHALMOLOGY.

On page thirty-five of Dr. Sym's "Diseases of the Eye" (Catechism Series)¹ the question is asked: "How is cataract to be treated?" The answer is, in substance, by extraction or needling, but a bracketed statement is added that: "Details of operation do not lend themselves to catechism description." We cordially endorse this opinion, but would extend its application to the study of ophthalmology generally. We fail to see the value of miniature textbooks like the present—without sparkle, without illustration and without dignity. The author seems to have avoided obvious misstatement unless it be his cursory dismissal of Hess's operation for ptosis.

¹ "The Catechism Series: Diseases of the Eye," by William George Sym, M.D., F.R.C.S.E.; second Edition; 1925. Edinburgh: E. and S. Livingstone. Crown 8vo., pp. 68. Price: 1s. 6d. net.

The Medical Journal of Australia

SATURDAY, OCTOBER 30, 1926.

To Our Readers.

A LITTLE more than a year ago a proposal was made to the several Branches of the British Medical Association in Association having for its object a substantial increase in the size of THE MEDICAL JOURNAL OF AUSTRALIA. The Branches had become more active and were devoting an increasing amount of attention to the primary function of the British Medical Association, the promotion of medical and the allied sciences. The medical profession in Australia has long since reached the stage of adolescence. In the course of a decade its numbers have increased by nearly 25% and the rate of increase has become accelerated year by year. With this growth of the profession the standard of efficiency has been raised and the teaching to students and to graduates has improved *pari passu* with the advances in medical science. The Branches have organized more scientific and clinical meetings. Sections devoted to the study of special departments of medicine have been instituted and important discussions have taken place on new as well as old problems. The amount of material worthy of publication that had been received by THE MEDICAL JOURNAL OF AUSTRALIA was considerable and there were indications that the inflow would become greatly augmented in the future. It had been ascertained that many authors had acquired the habit of sending their articles to the specialist medical journals in England and the United States of America, partly because there were no periodicals in the Commonwealth devoted to such specialties as ophthalmology, oto-rhino-laryngology, paediatrics, radiology, gynaecology, dermatology and so forth. Moreover it was realized by these authors that the prospects of early publication in this journal, even of sound, original work, were unfavourable. The supply of matter was far in excess of the available space. The proposal was that the Branches should increase for a time the *per capit*

payment for the journal on the understanding that the number of pages in each issue be increased from an average of just under twenty-six to a minimum of forty. The message took a long time to reach the Branches; there was some delay before the Directors of the Australasian Medical Publishing Company, Limited, had the replies and considered them. In the meantime an increase in the amount of advertising matter in the Journal solved part of the problem. It was therefore determined to allow the matter to stand in abeyance for six months. The Company is now producing a journal containing approximately thirty-three or thirty-four pages of reading matter each week without making any extra demands on the Branches. It is not anticipated that it will be possible to add materially to the number of pages of each issue in the near future.

It will be noticed that twenty pages are now devoted to original articles, reports of cases and reviews each week. With so large a space at our disposal we are justified in appealing to the members of the medical profession in the Commonwealth to use their own journal in preference to journals published elsewhere. In particular we would wish to enlist the cooperation of all those practitioners who are engaged in teaching or research work or who have special facilities for making original observations likely to advance our knowledge in any branch of medical science. The Hippocratic oath imposes on every medical practitioner the duty of imparting to his contemporaries everything that he may learn concerning disease. No practitioner is justified in withholding useful information from his colleagues. Moreover the medical press, medical books and medical meetings are the legitimate means available to medical men and women of advertising their knowledge, ingenuity or skill to the medical world. And of these the written word is the most enduring and the most eloquent testimony of professional attainments.

The message we send to our readers is to write more and to write carefully. The waiting period can now be reduced. Articles of especial merit will be published promptly, provided that their length is not out of proportion to the space allotted to original contributions. We appeal to the sense of

loyalty of our readers to give their Australian colleagues the first opportunity of benefiting by their teaching. Even the busiest man can find time to do his duty. Reports of cases are at all times welcome. The records do not as a rule occupy much space and a critical review of the significance of the physical signs and the symptoms, a discussion of the diagnosis or a comment on the aetiology, pathogenesis or course of the disease can usually be condensed. The value of the journal to the profession in Australia and in the eyes of the medical profession outside the Commonwealth depends on the quality of the articles included in the issues. Let each man have sufficient pride in his profession to impel him to offer something to maintain the standard of the only medical journal in Australia at a high level.

Current Comment.

THE OVARIAN HORMONE.

THE medical profession does not learn its physiology from advertisements of proprietary preparations. It has become increasingly common in recent times for advertisers of new biological and other remedies to collect scraps of information relative to the physiological effect of glandular extracts and bacterial preparations and antitoxins and to reproduce excerpts of this information as scientific reasons why medical practitioners should employ their wares. This vicarious teaching is foolish. In the first place it is read by few; the majority wisely seek information concerning physiological discoveries in scientific articles written without thought of commercial interests. In the second place it is recognized that nothing is more difficult than to assess the real value of a new remedy. The advertiser naturally culls the favourable records and ignores the findings that cast doubt on the efficacy of a remedy. In other words the advertiser's physiological teaching is biased and one-sided. At times it is dangerously inaccurate and misleading; it may be at variance with known facts. More often the advertiser is merely too enthusiastic in his advocacy of his special remedy.

A very large amount of work has been carried out concerning the internal secretion of the ovary and its physiology. Long before any accurate information was registered on this subject, ovarian extracts, dried ovarian substance and other ovarian preparations were placed on the market and boosted as infallible remedies for all kinds of menstrual and climacteric ills. The claims made for all these vaunted remedies were wholly unjustified. Unfortunately the medical profession lent itself to the

spoilers and tried the succession of preparations without realizing that there was no physiological basis for the treatment. We therefore welcome the appearance of an illuminating article by Privatdozent Dr. Albrecht Heyn on the evidence available in regard to the functions of the ovary, the site of production of the ovarian hormone, the nature of the hormone and the prospects of applying ovarian preparations for pathological conditions.¹ The author points out that it would be illogical to consider ovarian therapy until some if not all of the physiological effects of ovarian hormone were understood and until it could be shown that certain pathological conditions were associated with a failure of the hormone in one or other direction. The ovary has the function of regulating the changes in the uterine mucosa in connexion with menstruation and pregnancy. The ovary also governs the development and growth of the sexual organs, the vagina, the uterus and the mammae. It is known that when the ovaries are removed from a woman of child-bearing age, these organs degenerate. The ovaries are intimately connected with the development of the female pelvis and govern the deposit of fat throughout the body. It has further been demonstrated that the ovaries are concerned in the general balance of the glands of internal secretion; they exercise an influence over the vegetative nervous system and share in the maintenance of the metabolism of the body. It is interesting to note that Professor Ernst Laqueur, Dr. P. C. Hart and Dr. S. E. de Jongh² have employed estimations of the oxygen consumption and carbon dioxide elimination as the most reliable indication of the effect of ovarian preparations on spayed rats. They found that while a certain extract called menformon, to which further reference will be made below, consistently raised the metabolism in spayed rats, these changes were absent when extracts of other glands were employed or when menformon was given to castrated male rats. They therefore conclude that the ovarian preparation contains a specific ovarian hormone.

It is unnecessary to review the literature concerning the functions of the ovary; Dr. Heyn's summary may be accepted as sufficient and as covering all the functions of which definite proof has been adduced. In attacking the second question, he treads on less secure ground. It has been claimed by authorities in nearly every country that the main source of the ovarian hormone is the *corpus luteum*. Meyer and others have endeavoured to trace the hormone to the germ cell itself, but there seems to be grave objection to the acceptance of this thesis. Similarly it has been suggested on relatively slender evidence that the secretion is derived from the theca cells. Dr. Heyn is prepared to accept the view that the secretion is stored in the theca cells; but even this view does not carry conviction with it. More evidence is required before the exact relations of the ovum and the theca cells to the production of the ovarian hormone can be determined. It has

¹ Deutsche Medizinische Wochenschrift, August 6, 1926.

² Ibidem.

been demonstrated that the same active principle occurs in placenta and can be extracted from it.

Dr. Heyn is wise in refusing to express an opinion concerning the nature of the hormone. He realizes that hitherto ovarian preparations have not represented anything approaching pure hormone. No success has attended the attempts to isolate the active principles of the ovarian secretion. The hypothesis that there are two or three distinct ovarian hormones is no longer regarded as tenable. Professor Laqueur, however, claims that his water-soluble extract, menformon, is in fact pure ovarian hormone. He has not yet published a full account of the method of preparation and it is in consequence impossible to examine the evidence for or against his claim. He gives the results of experiments with his preparation, according to which it would appear that the substance is remarkably resistant to heat (up to 360° C. under favourable conditions), to alkalis and acids and to the action of peptic, tryptic and diastatic ferments, that it is readily adsorbed on to charcoal, filter paper and other membranes and that it is neither volatile nor capable of being distilled.

Dr. Heyn finds it difficult to determine with certainty whether ovarian preparations have or have not any specific action. This caution may be well founded in connexion with a few of the more recent preparations, but there should be no difficulty when judging the older extracts. "Oophorin" and "Ovarin" are dried ovarian substances of calves, pigs and cows. They were recommended to remove the symptoms of artificial or natural climacteric. Both have been found to be unreliable. "Lutein" tablets were supposed to be dried powdered *corpora lutea*. It is said that this preparation yielded quite good results for menopause disturbances, but failed entirely in dysmenorrhoea and amenorrhoea. Many other preparations were introduced after these early attempts, but the therapeutic action always proved to be unreliable. Some clinicians obtained excellent results, particularly in idiopathic haemorrhage, while others were dissatisfied. It must be remembered that there are many excellent haemostatic agents unconnected with the ovary. More than that, it may be said that ovarian preparations are not needed in the treatment of either haemorrhage or the symptoms of artificial or natural menopause. If the ovarian preparations exert a favourable influence in either condition, it is safe to regard the action as non-specific. Dr. Heyn is inclined to demand that a specific ovarian preparation must be able to exercise a definite influence on the development and growth of the sexual organs. He is also satisfied with direct evidence of increased metabolism in animals deprived of their ovaries when the extract or other preparation is exhibited. Tested in this way practically all the commercial preparations can be brushed aside as non-specific. Iscovesco and others discovered that extracts containing the active principle could be obtained provided that the ovarian lipoids were retained. Later workers, however, showed that the hormone is attached to the lipoid substance, but is not part of it. It is possible to remove the active principle from the lipoid and

to separate it in solution in water. But hitherto no preparation on the market has satisfied all the requirements. It is true that Dr. Heyn mentions a new preparation in a footnote, but until further evidence concerning it is available, it will be wiser to accept this somewhat sweeping statement. The medical profession should realize that until independent scientific evidence is presented that ovarian preparations contain the specific active principle of the *corpus luteum*, this form of therapeutics is unsound. It should further be remembered that ovarian hormone will not be needed for haemorrhages or amenorrhoea, since non-specific remedies are eminently satisfactory.

"MERCUROCHROME."

THE announcement of the discovery of a new drug is generally followed by reports of cases in which it has been used with success. At first the drug is used in one particular field of medicine, but later on somebody finds that recovery occurs after it has been used in quite another type of pathological condition. A reputation which is at times totally undeserved, may in this way be gained and the dangers associated with its use are often overlooked and unnecessary risks are run. "Mercurochrome—220 soluble" was elaborated by Young, White and Swartz in 1919. It contains 26% of mercury and is the sodium salt of dibromoxy-mercury-fluorescein. It was found that a one in a thousand solution kills *Bacillus coli communis* and *Staphylococcus aureus* in one minute, that a one in five thousand solution kills *Bacillus coli communis* in fifteen minutes and that a one in ten thousand solution kills staphylococci in the same time. "Mercurochrome" was intended in the first instance for use in the genito-urinary tract, but a search through the literature will reveal that since 1919 it has been used in the treatment of endocarditis, empyema, *ophthalmia neonatorum*, erysipelas, septicaemia, enteric fever, infectious diseases; it has been used in the peritoneal cavity, in the treatment of diphtheria carriers and in dental conditions.

In these circumstances attention needs to be drawn to the experience of Dr. Herbert H. Davis and to his conclusions.¹ After removing the Fallopian tubes of a woman for acute salpingitis he introduced twenty cubic centimetres of a 1% solution of "Mercurochrome" into the peritoneal cavity. A severe reaction followed and a faecal fistula soon formed. He then gave intraperitoneal injections to nine dogs; eight received five milligrammes per kilogram and the other ten milligrammes. All had severe reactions and one dog died. Five dogs received intravenous injections. Many of the animals were killed after forty-five hours and congestion of colon, ileum, kidneys, liver and lungs was found. Four had renal abscesses. Dr. Davis concludes that treatment with "Mercurochrome" is still in the experimental stage, that the drug should not be used indiscriminately and that it should be reserved for desperate cases.

¹The American Journal of the Medical Sciences, September, 1926.

Abstracts from Current Medical Literature.

THERAPEUTICS.

Treatment of Pyelitis.

J. M. HUNDLEY (*Journal of the American Medical Association*, February 27, 1926) discusses the causation and treatment of pyelitis in the female. The *Bacillus coli communis*, streptococcus and staphylococcus are the usual organisms found. The haemogenous is a more likely route of infection than the lymphatic or ascending routes. Pyelitis is very common in infancy and childhood, the symptoms being more general than local. In treatment the giving of alkalis is held to relieve symptoms, but to have no specific action in curing the affection. Ingestion of three to four litres of water *per diem* is of great value on account of the flushing action through the kidneys. "Hexylresorcinol," three or four capsules thrice daily, is useful in some cases, but unfortunately *Bacillus coli communis* infection is rather resistant to this drug, and diarrhoea is at times occasioned. "Hexylresorcinol" can be used for some weeks. If drugs are of no avail catheter drainage and renal lavage are necessary. Silver nitrate solution 1% or 2% is most useful for this purpose, as it causes a reaction in the pelvis with an outpouring of cells. The number of treatments by lavage varies between one and ten. Foci of infection such as dental abscesses or diseased tonsils should be removed.

Strophanthus.

E. E. CORNWALL (*Medical Journal and Record*, June 16, 1926) discusses the treatment of heart failure especially by the use of strophanthus. Digitalis is of proved value in auricular flutter and fibrillation, mainly through its action on the vagus. Strophanthus on the contrary is held to be a direct cardiac stimulant acting on the heart muscle, but not on the vagus. In severe uncompensated valvular disease and in dilatation from any cause, when the prognosis is bad, strophanthus is usually better than digitalis. In severe cases of right heart failure especially with much dilatation as in mitral disease amorphous strophanthin 0.00024 gramme (one-two hundred and fiftieth of a grain) should be given every four hours sublingually, intramuscularly or intravenously. In exceptional cases 0.0006 gramme (one-hundredth of a grain) may be given but should not be repeated within twenty-four hours. In any case the dose 0.00012 gramme (one-five hundredth of a grain) is sufficient for prolonged administration. Strophanthin is useful in the cardiac dilatation of pneumonia. Vaquez prefers "Ouabain" (crystallized strophanthin) 0.00025 gramme (one-two hundred and fortieth of a grain) every twelve hours for three doses and a fourth dose after an interval of twenty-four hours. As a rule the ideal dose

of strophanthin is the smallest practicable. A few patients manifest a gastro-intestinal idiosyncrasy to strophanthin.

Migraine.

G. STIEFELER (*Wiener Medizinische Wochenschrift*, April 3, 1926) has treated one hundred and twenty cases of migraine successfully with "Luminal." In addition the diet must be corrected—meat must be excluded, plenty of vegetables must be given and all foods must be served salt-free. Constipation must be attended to and alcohol forbidden. The dosage and the time required to effect a cure vary with the intensity of the attacks and the reaction to the drug. He has never seen any poisonous effects following its use. The treatment is commenced with doses of 0.025 grammes twice or thrice daily. This is reduced or increased to 0.05 grammes according to requirements. "Luminal" should be made up into a powder with 0.3 grammes of valerian root as a basis. Many patients are cured in a few weeks, but if the treatment is prolonged, "Luminal"-free periods should be interposed and bromides used instead. In some cases the attack is precipitated by the menstrual period and then large doses (0.05 to 0.08 grammes) should be given twice daily for six to eight days prior to menstruation. He has had successful results in twelve cases of this type.

"Digifoline" in Auricular Flutter.

L. F. BISHOP (*Medical Journal and Record*, June 16, 1926) discusses the treatment of auricular flutter. The condition should be suspected when an extremely rapid, regular ventricular rhythm (two hundred to three hundred and fifty beats per minute) is detected. Digitalis in adequate doses is a specific remedy, it converts flutter into fibrillation and slowing of the pulse with possibly a return to normal rhythm may supervene. Bishop quotes one case in which the contents of two ampoules of "Digifoline" were injected intramuscularly and a single ampoule every four hours afterwards until eight ampoules had been administered. The pulse rate fell to one hundred and forty per minute and later with the administration of one ampoule of "Digifoline" thrice daily to ninety. The symptoms subsided as the pulse rate decreased.

"Cardiazol."

G. L. WALDBOTT (*Medical Journal and Record*, June 16, 1926) refers to a new drug called "Cardiazol" which has recently been used in cardiovascular collapse. This preparation is obtained by the synthesis of two molecules of hydrazole acid and "Cyclohexamon." When administered subcutaneously to an animal it is instantly absorbed and exerts its action on the heart in a few minutes. It increases the amplitude of systole, slows the pulse rate and raises the blood pressure by stimulating the cardio-vascular centres in the medulla.

Waldbott reports three patients suffering from broncho-pneumonia, asthma with myocarditis and pulmonary oedema and septic tonsillitis with vascular collapse. One cubic centimetre of "Cardiazol" was injected subcutaneously. Within eight to fifteen minutes the effects were noted in slowed pulse rate, increased blood pressure and general improvement. Further trial of the drug is suggested.

Ephredine.

T. G. MILLAR (*Annals of Clinical Medicine*, March, 1926) discusses the origin and uses of ephredine. This is an alkaloid isolated from the Chinese herb *ma huang* which has been in use in China as a cardiac stimulant, diaphoretic and cough sedative since 3000 B.C. Chen and Schmidt in 1924 showed that ephredine raises blood pressure by vasomotor stimulation and increases heart action, stimulates uterine muscle, relaxes bronchial muscle and causes mydriasis. It is absorbed from the intestine and its action is more prolonged than that of adrenalin; its toxicity is very low. Fifty to one hundred milligrammes cause a rise of fifteen millimetres of mercury or more in blood pressure of patients, the heart beats more forcibly and the pulse is slowed. The drug has also been shown to have a constricting action on the nasal mucosa. On this account a 5% solution has been useful in nasal congestion; its action is prolonged for one to two hours. For conditions of shock ephredine has not so far been shown to be of much value. In convalescent patients and those in chronic ill-health whose blood pressure is low, ephredine temporarily increases blood pressure. In bronchial asthma the administration of twenty-five to one hundred milligrammes of ephredine orally or hypodermically gave relief in twenty-six out of thirty-six patients. Palpitation and tremor occurred in some instances. Twenty-five to one hundred milligrammes of ephredine in capsules twice or thrice daily caused cessation of attacks in some cases of prolonged asthma.

Parathyroid Hormone.

B. GORDON, J. L. ROARK AND A. K. LEWIS (*The Journal of the American Medical Association*, May 29, 1926) report the effect of parathyroid hormone on certain signs and symptoms of tuberculosis. Since calcification often occurs in healed tuberculous lesions, it has been said that an increased calcium content in the blood should benefit tuberculosis. Parathyroid hormone (Collip) increases the calcium content of the blood. Sixty patients in various stages of tuberculosis were given ten to twenty units of parathyroid hormone subcutaneously each day; later this dose was reduced. Clinical and biochemical examinations were made frequently. It was found that a number of patients gained strength, especially on small doses of the hormone. Muscular pains and arthritic pains were often lessened. A subjective feeling of warmth was common. Cough, pleural

pain and dyspnoea were sometimes relieved; the throat was dry when blood calcium was high (thirteen or fourteen milligrammes per hundred cubic centimetres). Haemoptysis was controlled in many patients. The calcium content of the blood was usually increased within twelve hours of an injection from the normal nine to eleven milligrammes to twelve or fourteen milligrammes per hundred cubic centimetres of blood. X ray examinations revealed no unusual changes, calcification was not apparently increased in the lungs. Clotting time of the blood was reduced in a few instances. Though the blood calcium was raised, there was no evidence that the utilization of calcium by the body was improved or increased. The general favourable effect of the control of haemoptysis was most pronounced when five to fifteen units of hormone were given once or twice a week. Unfavourable effects in some cases were joint pains, dry throat, increased cough, weakness, increased fever and pulse, loss of weight and appetite. These results were generally due to overdosage and ceased when the treatment was withdrawn. The authors conclude that there appears to be no favourable effect on pulmonary tuberculosis from maintaining a high calcium content in the circulating blood.

UROLOGY.

Bacterial Cystitis in Females.

W. T. BRIGGS (*Journal of Urology*, February, 1926) reports observations made by himself on two hundred and fifty female patients with frequency of micturition as their chief complaint. He finds that bacterial cystitis is the commonest cause of the symptom. It was the causal condition in 35% of the patients in the series. Under this heading are grouped all cases of infection of the bladder in which no involvement of other parts of the urinary tract exists at the time of examination. Except when the bladder infection remains after a renal infection has been cured by Nature or other means, cystitis in the female is usually due to bacterial invasion through the urethra. If fever is present or there is renal tenderness or pain, a kidney rather than a bladder infection must be suspected as the original source. But if the history and the physical examination suggest bladder rather than kidney infection, there is justification for using vesical irrigations for a few days as a therapeutic test, before the performance of cystoscopy and ureteric catheterization. Almost any mild antiseptic solution may be used in this treatment. The author has found "Argyrol" in strength varying from 3% to 10% very effective. About sixty cubic centimetres are injected after drainage of the bladder with a catheter and the patient is instructed to retain it for thirty minutes. Daily treatments are given until the bacteria

disappear from the urine. If after three treatments there is no definite diminution in the bacterial count, a full urological examination must be made.

Radiotherapy of Prostatic Adenoma.

F. LEGUEU (*Urologic and Cutaneous Review*, April, 1926) discusses the influence of radiotherapy on senile adenoma of the prostate. He does not use the method himself, but has studied the local conditions in patients coming to him for prostatectomy after radiotherapy elsewhere. He found that the results obtained from X rays were very variable, but upon the whole not favourable, so that as a rule radical operation still remained necessary. He does not contest the reality of a powerful action by X rays upon the adenoma, but the question is whether or no the method is able to arrest the progress of the prostatic disease and relieve retention. Moreover, the adenoma itself is not alone responsible for troubles arising from retention; concomitant alterations of the bladder neck play an important and sometimes predominant part. When radiotherapy causes diminution of the adenoma, it substitutes a fibrotic sclerosis for an adenomatous hyperplasia and often renders micturition more difficult instead of easier. Radiotherapy will for a time relieve certain of the symptoms, but does not modify the more important effects, nor does it arrest the course of the disease itself.

Antiseptic Drugs in Experimental Urinary Infections.

H. F. HELMHOLZ AND R. S. FIELD (*Journal of Urology*, April, 1926) have approached the question of the relative values of the chief urinary antiseptics by means of noting their effect on pyelitis experimentally produced in rabbits. They introduced suspensions of bacteria into the ear vein in some cases and into the bladder in others. Some of the animals were then treated with "Mercurochrome," others with "Hexylresorcinol" and others with "Hexamine"; a fourth series of animals was left untreated and acted as controls. At intervals of two to three days catheters were passed. The amount of pus was noted and the number of bacterial colonies grown from each cubic centimetre of urine was counted. After two successive sterile cultures had been obtained, medication was discontinued and two days later the urine was again cultured to see if it remained sterile without the presence of the drug. In addition all the animals were later subjected to autopsy to determine exactly what anatomical lesions were present, particularly in the kidneys. It was uniformly found that "Hexamine" was superior to the other two drugs as a urinary antiseptic. It was also noted that the *Staphylococcus albus* was much more susceptible to the action of "Hexamine" than was the colon bacillus. In large, healthy rabbits, inoculated as described, the dose of

"Hexamine" by mouth necessary to secure a sterile urine was 0.5 grammes given twice a day.

Remote Results in Ureterorrhaphy.

M. BOUCHARD (*Journal d'Urologie Médicale et Chirurgicale*, January, 1926) discusses the remote functional and anatomical results after suture of the divided ureter and issues a report on a patient observed nineteen years after the accidental division and immediate suture of the duct. The patient reported recently with renal colic, pyuria and fever and was found by pyelography to be suffering from pyo-ureter and pyonephrosis. The dilatation of the ureter was not, however, as in most cases of sutured ureter dependent upon a gradual narrowing of the lumen at the site of suture; the lumen was widely open at this point. Apparently the muscle fibres above the line of suture no longer pass on their influence to those below it, as physiologically happens during normal peristalsis; there is contact, but no longer harmony in the ureteric musculature. Added to this, interruption of the sympathetic fibres by direct and sometimes retrograde degeneration finally leads to complete inertia of the canal with consequent atony and dilatation. It is probable that this tends to occur in all cases of ureteric division and suture and the development of a stricture would only increase the trouble by adding a mechanical to the physiological factor.

Reaction of the Urine in Cystitis.

N. BLAUSTEIN (*Journal of Urology*, April, 1926) considers that in primary acute bacterial cystitis the most important factor in the treatment is to change the reaction of the urine as soon as possible. While it is easy to render an acid urine alkaline, the reverse is often exceedingly difficult. For alkalization, sodium bicarbonate is best and is given in doses of four grammes four times a day. Alkaline mineral water is also given freely. After the urine has been alkaline for twelve to fifteen days, the acute symptoms will have disappeared and a return to an acid urine and the administration of "Hexamine" is advisable. To render the urine acid in alkaline cystitis the best drugs are ammonium chloride or calcium chloride in two-gramme doses four times a day. When the urine is acid "Hexamine" is given, preferably once a day as an intravenous injection of one gramme. The intravenous route avoids the breaking up of the "Hexamine" in the acid stomach contents and the consequent partial loss of the liberated formaldehyde. When an alkaline cystitis is rebellious and the change to an acid urine cannot be secured, three or four *Bacillus bulgaricus* tablets are dissolved in fifteen cubic centimetres (half an ounce) of sterile water to which a little lactose has been added and this emulsion is injected daily into the bladder. The organisms proliferate in the bladder urine and render it acid.

British Medical Association News.

SCIENTIFIC.

A MEETING OF THE NEW SOUTH WALES BRANCH OF THE BRITISH MEDICAL ASSOCIATION was held at The Royal North Shore Hospital of Sydney, on September 9, 1926. The meeting took the form of a series of clinical demonstrations by members of the honorary staff.

Pott's Disease.

DR. ERASMS BLIGH showed a man, aged thirty-five years, an engine driver who had been admitted to hospital on April 20, 1926, complaining of sharp pain in the right shoulder and back of seven days' duration. Ten days prior to admission the patient had suffered from a recurrent soreness of the throat. Three days later pain had occurred in the right shoulder and small of the back with a shivering attack. After another three days the right sterno-clavicular joint had become painful. On examination the right sterno-clavicular joint had been red, swollen, tender and fluctuant. The temperature had been 38.4° C. (101.2° F.) and the pulse rate 88 in the minute. No abnormality had been detected in other joints. On April 28, 1926, Dr. Bligh had incised the joint and evacuated about sixty cubic centimetres of pus from which a pure culture of non-haemolytic streptococci was isolated.

The patient's blood had been examined on April 22, 1926, with the following results:

Erythrocytes, 5,000,000 per cubic millimetre;
Hæmoglobin value, 73%;
Colour index, 0.7;
Leucocytes, 11,250 per cubic millimetre;
Neutrophile cells, 95%;
Lymphocytes, 5%.

On May 7, 1926, examination of the blood had yielded the following results:

Erythrocytes, 4,300,000 per cubic millimetre;
Hæmoglobin value, 70%;
Colour index, 0.8;
Leucocytes, 15,625 per cubic millimetre;
Neutrophile cells, 88%;
Lymphocytes, 12%.

On May 31, 1926, the leucocytes had numbered 11,250 per cubic millimetre, the neutrophile cells 64% of these and the lymphocytes 35%. Blood culture on May 5, 1926, had been sterile.

A series of X ray examinations had been made. These were described in detail and the skiagrams were shown. On May 7, 1926, some lipping of the eleventh and possibly the twelfth dorsal vertebra and lipping of the upper part of the third lumbar vertebra had suggested osteoarthritis. No evidence of tuberculosis had been found. On June 1, 1926, the radiologist had reported some necrosis of the anterior portion of the second and third lumbar vertebrae with narrowing of the intervertebral spaces which was very suggestive of tuberculosis. On July 23, 1926, signs of ossification had suggested arrest of the lesion and on August 24, 1926, dense callus formation with some bony union had been present. The urine contained a few pus cells (*Staphylococcus albus*), but no other abnormality.

Another patient shown by Dr. Bligh was a carpenter, aged twenty-five years, who suffered from tuberculosis of the fifth lumbar vertebra. This lesion had been revealed by X ray examination on July 28, 1925. By November, 1925, the pathological process had extended appreciably and involved both the fourth and fifth lumbar vertebrae. At first seropurulent fluid and later pus had been evacuated from a swelling in the right lumbar region just above the iliac crest. No tubercle bacilli had been found on examination. X ray examination on August 12, 1925, showed that the disease was arrested and signs of bone regeneration were found. The patient's wound had healed and he had been treated at a convalescent home.

Pericarditis.

DR. F. J. BRIDGES showed a man, aged forty-two years, a miner, who had been admitted to hospital with a provisional diagnosis of pericarditis. Auricular fibrillation

was also present. The patient gave a history of acute rheumatism twenty years previously. He had suffered from a "heart attack" fourteen years previously and from three or four similar attacks since then. He had suffered from a bad cold in the winter and had been in bed ever since. His family history was clear. He was a moderate smoker and drinker and denied venereal infection. The serum had not reacted to the Wassermann test.

The patient's symptoms at the time of demonstration were breathlessness on exertion, pain over the heart and liver, weakness of the legs, swelling of the ankles and cough. The apex beat of the heart was in the sixth intercostal space. The heart sounds were irregular. Both pre-systolic and systolic murmurs were audible at the mitral area. The second sound was impure. At the aortic area an accentuation of the second sound could be heard. The liver was enlarged seven and a half centimetres below the costal margin. The radiologist had reported enlargement of the right side of the heart suggesting aneurysm. There was also a suggestion of fibrous tissue around this enlargement.

Chronic Otitis Media with Perisinus Abscess.

DR. E. P. BLASHKI showed a patient who had suffered from chronic otitis media and perisinus abscess. This case will be reported in full in a subsequent issue.

Sacralization of the Fifth Lumbar Vertebra.

DR. S. H. SCOGALL showed a man, aged twenty-three years, a motor mechanic, who was suffering from sacralization of the fifth lumbar vertebra. At the age of thirteen the patient had fallen from a horse, but felt no effect after a day or two. Twelve months later he had complained of pain in the side which continued for about eighteen months. He had been free from pain for about four years. At the age of eighteen he had undergone a course of physical culture for curvature of the spine and until the age of twenty-one he had been quite well except for an occasional attack of "rheumatism." At the age of twenty-one he had been attacked by pain in the right side which gradually became worse. The condition had been diagnosed as appendicitis and the appendix was removed, several adhesions to the bowel being present. The operation had not relieved the patient's pain. Six months prior to admission the patient had complained of pain in the buttock and also in the right leg, the pain was worse after the patient had been sitting for any length of time. During this period the patient was drinking very heavily.

Dr. Scougall showed skiagrams of the condition and said that suspension by the head resulted in complete straightening of the scoliosis which was present, but that it immediately gave rise to pain in the lower part of the back on both sides and to a sciatic pain on the left side. The adolescent type of scoliosis would scarcely be amenable to full correction after five years. There was no history of anterior poliomyelitis. X ray examination revealed a greatly enlarged left transverse process of the fifth lumbar vertebra. It was about twice as long and three times as wide as its fellows. It was sacralized by means of a false joint. Dr. Scougall thought that this was most probably the cause of the long curvature which was concave to the left. The sciatic pain might be caused either by the alcoholism or by the bony abnormality, but the patient had not touched alcohol for over six months and stretching movements of the sciatic nerve did not cause pain.

Plastic Operation on Hand.

Dr. Scougall also showed a man, aged forty-seven years, an engineer, who had been admitted on June 26, 1925, suffering from lacerated wounds of the left hand. The hand had been caught in wire belting. X ray examination had revealed that the phalanges of index, middle and ring fingers were missing and that fracture of the proximal phalanx of little finger with backward displacement of distal fragment was present. It had been necessary to perform three operations at intervals on account of continued suppuration and necrosis of bone.

Operation had also been carried out on December 1, 1925. The whole of the soft parts with remains of metacarpal bones between the first and fifth metacarpal and proximally

as far as the carpus had been removed. He had been unable to approximate his fifth finger to the thumb. The proximal phalanx of the fifth finger had been cut through and reset with rotation of the distal portion towards the thumb allowing direct approximation. The proximal phalanx had been chosen as he had already a union there with angulation. Dr. Scougall pointed out that the patient had slight voluntary movement of the distal phalanx of the little finger and good movement of the metacarpophalangeal joint. The thumb had practically full movements. The patient was a quarryman and could hold well a brick weighing four kilograms (nine pounds). He also did some shovelling. He could do all the work of an engineer though not as rapidly as normal. He could lace his boots and use a fork well and could pick up a pin.

The question of removing the fifth finger had been considered, but in its present position it was not in the way and was useful in various ways as a hook.

Spastic Paraplegia.

Dr. Scougall's third patient was a girl, aged three years, who had been found shortly after her first birthday to be suffering from typical spastic paraplegia. Lumbar rhizotomy had been performed on December 18, 1924, and January 8, 1925.

She was able to stand alone about five months before the meeting and more recently had been able to take about four steps alone. This had been acquired largely without reeducation as the patient lived too far away. Ankle clonus was difficult to elicit and knee jerk was about normal.

The patient was shown for comparison of rigidity with another patient of about the same age suffering from spastic paraplegia and not subjected to operation. The rigidity was about the same in both cases.

Artificial Pneumothorax.

DR. COTTER HARVEY showed several patients, suffering from pulmonary tuberculosis, whom he was treating by the production of an artificial pneumothorax. The first was a man, aged twenty-nine years, a printer, who had been treated at the Anti-Tuberculosis Dispensary as an out-patient. He had suffered from pains in the back for four weeks with cough and yellowish sputum and shivering attacks. Two brothers and one sister had died of pulmonary tuberculosis and one brother suffered from the same disease. Examination had revealed a hectic flush and fetor of the breath. The temperature had been 38.9° C. (102° F.) and the pulse rate 104 in the minute; the chest signs were indefinite. X ray examination had revealed signs suggestive of abscess or bronchiectasis. After admission to hospital on March 8, 1926, no tuberculosis had been detected on radiological examination, but the radiologist reported chronic bronchitis with bronchiectatic cavities in both hilar regions. The sputum had contained numerous tubercle bacilli. After the fever abated, arrangements had been made for the patient's transfer to a sanatorium, but he became febrile again with much purulent sputum. The signs had persisted and extended towards the left base. Artificial pneumothorax had then been produced and several injections of air had been made. The injections had been controlled by X ray examination, no adhesions were present and good collapse of the lung was obtained. The cough became much less. By September 1, 1926, no tubercle bacilli could be discovered in the sputum. On the occasion of the first injection three hundred cubic centimetres of air had been used and the negative intrapleural pressure had been altered from -8 to -4 on inspiration and from -4 to -1 on expiration. At the last or thirteenth injection seven hundred and fifty cubic centimetres of air were used and a pressure of -8 on inspiration had been altered to a pressure of +2 and on expiration the figures were -1 and +4.

The second patient was a woman, aged twenty-nine years, who had been admitted to hospital on February 5, 1925, two months after haemoptysis. The patient had lost weight. Impaired resonance, weak breath sounds and rales had been audible at the left apex. X ray examination revealed mottling in the left lung suggestive of tuberculosis and tubercle bacilli were numerous in the sputum. The

pyrexia had continued in spite of rest in bed and it had been decided to cause collapse of the left lung. Several introductions of air had been made into the pleural cavity and the patient had improved considerably. She had returned to her home in the country and came back at intervals to have refills carried out. She was able to do her own housework and was putting on weight. Twenty-seven injections of air had been given. On the first occasion two hundred and fifty cubic centimetres of air were used; a pressure of -11 had been altered to -7 on inspiration and from -8 to -5 on expiration. On the last occasion nine hundred cubic centimetres of air were used. A pressure of -4 was altered to a pressure of +5 on inspiration and on expiration the figures were -1 and +9.

The third patient was a man, aged thirty-four, a deck hand, who had been admitted to hospital on June 16, 1926, with a history of cough leading to vomiting, sputum and loss of weight for six months. Clinical examination had revealed signs of infiltration and pleurisy at the right apex, tubercle bacilli had been numerous in the sputum and X ray examination had revealed extensive tuberculosis of the right lung, the left lung was normal. At this stage artificial pneumothorax had been produced. Air had been introduced at irregular intervals since that time. Dr. Harvey pointed out that the patient's clinical condition was much better, he had hardly any cough, he had put on a great deal of weight and he had practically a complete pneumothorax with a little fluid at the right base. Twenty-three injections had been given. On the first occasion three hundred cubic centimetres of air were used; a pressure of -16 had been reduced to -10 on inspiration and from -10 to -6 on expiration. On the last occasion seven hundred cubic centimetres of air were used; a pressure of -10 was altered to a pressure of +5 on inspiration and on expiration the figures were -3 and +6.

The fourth patient was a married woman, aged thirty-five years, who had come under treatment on March 26, 1925. She had given a history of haemoptysis on the previous day and of loss of weight. No cough and no sputum had been present. Flattening had been found at the right apex with an impaired percussion note; bronchial breathing and crepitations were present and the percussion note was also impaired at the left apex. Radiological examination had revealed tuberculosis of the right lung with cavitation and very slight involvement of the left lung. Tubercle bacilli had been present in the sputum. Artificial pneumothorax had been produced for the first time on May 14, 1925, and since that time twenty-four introductions of air had been made. On the first occasion two hundred and fifty cubic centimetres of air were introduced; a pressure of -14 on inspiration had been altered to -7 and a pressure of -10 on expiration to -4. At the last injection thirteen hundred cubic centimetres of air had been used; a pressure of -8 on inspiration was altered to -0 and a pressure of -2 on expiration to +6. At the time of demonstration the patient had gained in weight, had neither cough nor sputum and was keeping well.

Bronchiectasis with Septicæmia.

Dr. Harvey's last patient was a man, aged twenty-four years, a milk carter, who had been admitted to hospital on July 25, 1924, suffering from dyspnoea and loss of weight of three months' duration and with a history of haemoptysis two days previously. On examination no abnormality had been found in the chest. A doubtful systolic murmur had been present at the mitral area. Clubbing of the fingers had been noted and the X ray appearances were indefinite. The sputum had been examined on many occasions for tubercle bacilli without results. At this time the patient had suffered from occasional rises of temperature, on one occasion it had been 40.2° C. (104° F.). He had been discharged from hospital with a diagnosis of either pulmonary tuberculosis or septic endocarditis. For the following eighteen months he had attended the Anti-Tuberculosis Dispensary at intervals. In May, 1926, the patient's breath had become fetid and sputum had appeared, impaired resonance with rales was noted at the right base. A provisional diagnosis of bronchiectasis had been made.

On May 24, 1926, the patient had been readmitted to hospital with physical signs extending at the right base and with pyrexia. *Staphylococcus aureus* had been the

predominant organism in the sputum. Samples of blood had been taken on two occasions during an attack of fever and *Staphylococcus aureus* was grown on culture. Since that time the patient had been treated with antistaphylococcal serum, with "Oscol" manganese and staphylococcal vaccine; no improvement had occurred in his condition. At the time of demonstration signs of very extensive cavitation were present in the right lung and bubbling râles were heard in the left lung. The patient coughed up a great deal of sputum and was suffering from almost continual pyrexia. His general condition was slowly deteriorating.

Dermatological Conditions.

DR. GEORGE R. HAMILTON showed a patient who was suffering from extensive psoriasis and another who was suffering from *urticaria pigmentosa*. He discussed the differential diagnosis and described the treatment of each condition.

Osteitis Deformans.

DR. H. HUNTER JAMIESON showed a male patient, aged sixty-five years, who had been a printer's assistant fourteen years previously, but for the last nine years had been acting as a librarian. The patient had enjoyed quite good health until five years previously with the exception of severe pain which he had had in the small of the back at intervals for fourteen years. During the previous five years he had suffered from indigestion and diarrhoea and had gradually lost weight. During the previous twelve months he had gradually and progressively become deaf. Quite recently he had complained of a buzzing in the ears, but he had never suffered from headaches. During the last five years he had noticed that his head was becoming bigger, he had gradually found it necessary to get bigger hats. During this period he had become smaller and during the last eighteen months he had lost considerably in height. He denied venereal infection. His father had died at the age of eighty-two a healthy man, his mother was aged eighty-five and still living. He had neither brothers nor sisters. His mother had been married twice, one step-sister had died from dropsy and the other had died at a very early age from some unknown cause. The patient's head was apparently much increased in size. Skiagrams were shown of the patient's skull and these manifested the changes usually seen in *osteitis deformans*. There was no abnormality about the patient's ears, his spine was bent and fixed. His tibiae were curved, but his femora appeared quite straight. The heart was definitely hypertrophied and a loud systolic blowing murmur was audible. The apex beat was in the sixth intercostal space about ten centimetres (four inches) from the middle line and the left border appeared to be about twelve and a half centimetres from the middle line. The systolic blood pressure was 150 and the diastolic pressure 100 millimetres of mercury. The urine was acid and contained neither sugar nor albumin.

Fracture of Femur and Tibia.

DR. FRANK W. DOAK showed a male patient, aged thirty-two years, a signwriter who had been admitted to hospital on November 23, 1925, with a history of having collided with a motor car while he was riding a motor cycle. On examination a fracture of the right femur had been discovered together with a punctured wound on the posterior aspect of the right leg, the latter being characterized by free hemorrhage. The leg had been put up in a Jones's splint, extension being obtained by a Schmerz hook inserted into the condyles of the femur. Two days later X ray examination had revealed a comminuted fracture of the femur involving the upper half of the shaft, the fragments were widely separated. On November 30, 1925, a wire netting sling had been applied to the splint. On December 9, 1925, the radiologist had reported that the fragments were in fairly close apposition, but that some angulation was present. On December 29, 1925, examination under anaesthesia had revealed that non-union was present. The hooks had been removed and the limb had been put up on Thomas's splint with strapping extension. On January 8, 1926, the splint had been removed and the leg placed between sandbags in preparation for open operation.

On January 12, 1926, operation had been undertaken, the fragments were levered into position and sutured with silver wire. A long Liston splint had then been applied. X ray examination had revealed that the outer and upper fragment of the comminuted fracture of the tibia was displaced slightly outwards. Viewed laterally the position was good.

On January 22, 1926, the radiologist had reported that the position of the fractured femur was poor owing to the degree of comminution. The upper end of the lower fragment was displaced backwards to a considerable degree.

On February 16, 1926, the position of the fragments of the femur had been unchanged, but some callus formation was found to be present. Slight outward displacement of the lower part of the shaft of the tibia had been seen, but no bony union was visible.

On March 1, 1926, massage and hot air treatment had been instituted, and on March 16 walking calipers had been fitted and the patient moved about on crutches. The leg was five centimetres shorter than its fellow and the patient was to attend the Orthopaedic Out-Patient Department.

Osteomyelitis of the Tibia and Femur.

DR. E. M. HUMPHREY showed a male patient who had been admitted on May 21, 1924, at the age of sixteen years with a history of intermittent fever, not affected by salicylates. Painful swellings had been present in the regions of the left knee and ankle. The patient had given a history of previous attacks of acute rheumatism. A leucocytosis had been present, but blood culture proved to be sterile. X ray examination had revealed osteomyelitis of the tibia and the femur. The tibia had been opened in its upper and lower thirds and the femur in its lower half. The patient had eventually become convalescent on November 26, 1924.

Dr. Humphrey also showed a school girl, aged fourteen years, who had been admitted on June 4, 1926, with a history of pain and swelling in the region of the right knee for about five weeks. The patient's temperature chart had been of the hectic type. The patient had given a history of a succession of falls and knocks on the leg prior to the onset of the symptoms. The right knee joint had been aspirated in a private hospital, serous fluid sterile on culture was evacuated. On examination on admission pain and swelling in the lower part of the right thigh and the right knee had been found. X ray examination revealed periostitis of the lower half of the femur and a rarefied area at the lower end of the femur suggested osteomyelitis. After discovery of a moderate leucocytosis operation had been undertaken. Purulent medullary tissue had been removed from the lower third of the femur and the cavity had been packed with menthol and glycerine gauze. The knee joint had been opened and pus evacuated, a rubber drain was inserted. The patient made an uninterrupted recovery and was discharged from hospital on July 28, 1926.

Depressed Fracture of the Skull.

DR. ERASMUS BLIGH showed a school girl, aged eleven years, who had been knocked down by a motor car on June 24, 1926. She had been unconscious and irritable with a depressed fracture in the left parietal region of the skull, a haematoma of the left eyelid was also present. Operation had been performed immediately. A large, circular depressed fracture, involving the left temporal and parietal bones, was exposed and blood and lacerated brain substance escaped. The bones had been elevated. During the period of recovery subconjunctival haemorrhage was noticed in the left eye and twitching in the right side of the face, right hand and right leg. For four days out of five there had been repeated fits, each lasting from two to fifteen minutes. Fever had been present with purulent discharge from the wound. After two weeks improvement had occurred and the patient made an uneventful recovery, being discharged in good condition on August 3, 1926.

DR. E. M. HUMPHREY also showed a school girl, aged five and a half years, who was knocked down by a bicycle on August 25, 1926. The patient had been unconscious with a compound fracture of the skull in the right parietal

region. Severe haemorrhage had occurred. At operation the scalp wound had been enlarged and jagged pieces removed from the brain substance. The haemorrhage had been checked by gauze packing. At the time of demonstration the patient was making good progress and some pus was draining from the wound.

Lupus of the Palate.

DR. RAMSAY BEAVIS showed a woman, aged twenty-six years, who had attended the Out-Patient Department on April 11, 1926, complaining of a sore throat of about six months' duration with pain on swallowing. Infiltration and ulceration of the soft palate on both sides of the uvula had been present. A specimen had been removed and examined pathologically, a diagnosis of lupus was made. The patient's serum had not reacted to the Wassermann test and no Klebs-Löffler bacilli were found. No definite signs of disease had been found on examination of the lungs. The areas affected had gradually extended to the right aryepiglottic fold, the right arytenoid and the posterior pharyngeal wall, despite several applications of the galvanic cautery. On August 4, 1926, diathermy had been applied to the soft palate and on September 6, 1926, to the posterior pharyngeal wall. At the time of demonstration the palate had healed with slight scarring. Good movement of the palate was present. The disease was extending down the pharynx and the pharyngeal surface of the larynx on the left side was infiltrated as the palate had been.

Gumma of the Septum of the Nose.

DR. BEAVIS also showed a woman, aged fifty years, who was suffering from a gumma of the nasal septum. The patient's family history was good. She had no children and had had no miscarriages. Discharge had been present from the nose for six weeks, the left side of the nose became depressed and breathing obstructed. On examination tertiary syphilitic ulceration of the posterior pharyngeal wall was present and a gumma of the nose had caused bony necrosis. The patient's serum had yielded a "+++" reaction to the Wassermann test.

Foreign Body in the Nose.

DR. BEAVIS also showed a foreign body which had been removed from the nose of a man, aged forty-five years. The man had complained of "something in the nose" for about four years. He had contracted syphilis fifteen years previously and received two injections of "Salvarsan" and short treatment with mercury. A large foreign body had been removed from the nose. The nasal septum had almost completely disappeared. The foreign body consisted of necrosed bone with a tooth attached. The tooth in Dr. Beavis's opinion was either a supernumerary lateral or else an undeveloped lateral tooth. The crown and root were undeveloped.

Chronic Nephritis.

DR. ERIC ASPINALL showed a patient who was suffering from chronic interstitial nephritis. A report of this case will be published in a subsequent issue.

Eye Lesions.

DR. E. C. TEMPLE SMITH gave a demonstration of common eye lesions. He discussed the diagnosis and described the treatment in each instance.

Urological Diagnosis.

DR. R. J. SILVERTON demonstrated a series of pyelograms, ureterograms and cystograms. He pointed out that a urinary tract infection often needed a fuller investigation than was usually carried out, even if that investigation were done by the urologist. The latter should not satisfy himself with cystoscopy, catheterization of the ureters and functional tests when a chronic infection did not disappear with renal lavage. Endoscopy of the whole upper portion of the urinary tract (pyelography and ureterography) often disclosed an unsuspected lesion in the shape of a stricture or kink of the ureter; if no attention was paid to such a mechanical obstruction, pelvic lavage would effect no permanent cure. In regard to the question of determining whether a suspicious shadow originated from

a urinary calculus, Dr. Silverton pointed out that two pyelograms or ureterograms should be taken on successive films, one with the patient slightly tilted to one side. In this way, even if an extraneous shadow accidentally overlaid the ureteric or pelvic shadow in one film, it would be separated from it in another. A series of urograms illustrated this point.

DR. SILVERTON showed the skiagrams in the case of a woman, aged thirty-eight years, with a renal pelvic stone on the right side and a congenital megaloureter and hydronephrosis on the left side. The ureter was over two and a half centimetres (one inch) wide and the renal pelvis held about one hundred cubic centimetres. The renal efficiency was very low on the left side. The pelvic stone had been removed from the right side and on account of renal pain and reflex vomiting, Dr. Silverton was considering the excision of the left ureter and kidney.

An interesting case was demonstrated. Acute pyelonephritis of pregnancy was present on the right side and the kidney on the left side had been absent at birth. This occurred in a girl of fifteen years. Nephrotomy on the right side had resulted in cure.

The cystogram of a woman of seventy was shown. The patient was being treated for cardiac failure when she had complained of severe symptoms of cystitis. Cystoscopy disclosed the orifices of several diverticula on the right side of the bladder and their outlines were demonstrated by a cystogram.

Skiagrams and Pathological Specimens.

DR. H. R. SEAR, DR. W. B. DIGHT and DR. K. C. VICKERY demonstrated a series of interesting skiagrams and specimens from the Pathological Department were shown.

NOTICE.

THE attention of members of the Queensland Branch of the British Medical Association is directed to a notice which appears on the last page of this issue under the caption "Medical Appointments: Important Notice." They are strongly advised not to sign agreements in connexion with appointments to the staff of country hospitals in Queensland without having previously submitted the agreements to the Branch Council for perusal.

Congress Notes.

AUSTRALASIAN MEDICAL CONGRESS (BRITISH MEDICAL ASSOCIATION).

THE second session of the Australasian Medical Congress (British Medical Association), which is to be held in Dunedin from February 3 to February 10, 1927, promises to be of unusual interest to the medical profession. Apart from the scientific importance of the meeting the South Island of New Zealand offers singular attractions to the visitor. Of Dunedin itself much could be written. It is a beautiful city of some 75,000 inhabitants. Its public buildings, wide streets and picturesque suburbs render it an ideal place for the tourist. In February the climate is excellent. A general view of the city is reproduced through the courtesy of the New Zealand Government Office in Sydney, to the Manager of which we wish to express our thanks. It is impossible in this place to describe the institutions of the city or its general appearance. We recommend our readers to take advantage of the Congress to gain acquaintance with it at first hand.

THE MEDICAL SCHOOL OF THE UNIVERSITY OF OTAGO.¹

THE University of New Zealand of which the University of Otago is a constituent college, differs from the

¹ Contributed by Professor D. W. Carmalt Jones at the request of the Executive Committee of the second session of the Australasian Medical Congress.

Universities of the Australian States. In each of the latter the University is situated in the capital city and with its university buildings, faculties and residential colleges it is contained within its own ring fence.

Settlement in New Zealand is of a different character from that in Australia, in the former there is no accumulation of half the population of the State in a single great city, but a fairly even distribution exists over the eight hundred miles' length of the two islands, with relatively minor concentration in the four centres of Auckland, Wellington, Christchurch and Dunedin; University affairs are arranged to comply with these conditions.

The Scotch settlement in Otago, of which Dunedin is the "centre," with the national respect for education, founded the University of Otago in 1869, but in 1870 the University of New Zealand was established of which the University of Otago became a constituent college, retaining the title of University, but no longer granting degrees. University Colleges were founded in the other centres.

The University of New Zealand is comparable to the University of London or perhaps more closely to the University of Wales. It conducts examinations and grants degrees and prescribes or approves courses of study, but undertakes no teaching which is all delegated to the constituent colleges. Arts and science are taught in all colleges, but some of the professional faculties, such as medicine, dentistry, engineering, are each situated in one centre only; the School of Medicine belongs to the University of Otago and is situated at Dunedin.

The Otago University buildings make up a handsome block largely built of the local blue-stone, a hard basalt,

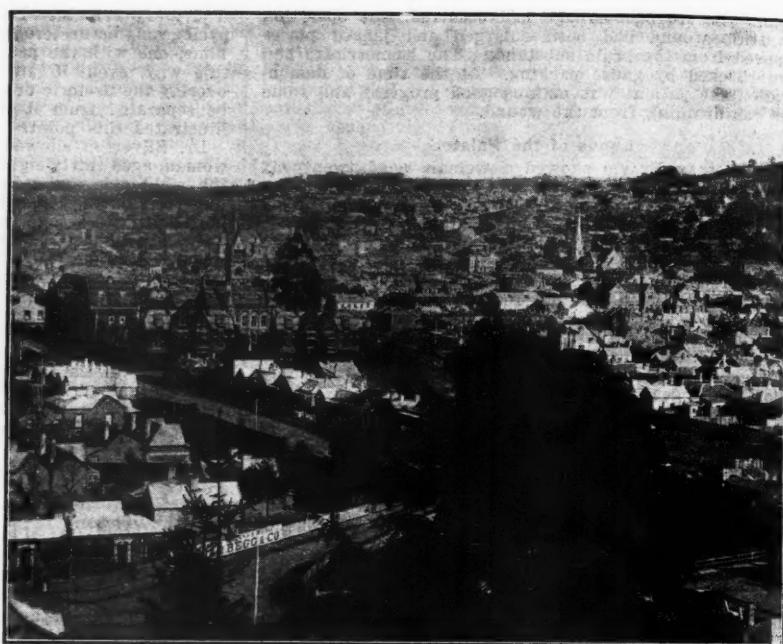


FIGURE I.
Dunedin from Garden Hill.
(New Zealand Government Publicity Photograph.)

well adapted to academic architecture, but the faculties have outgrown the accommodation originally assigned to them. The Dental School has separate buildings of its own. New buildings for the Medical School were opened in 1916, in the neighbourhood of the hospital, chiefly for the departments of pathology and bacteriology, with great advantage to the clinical application of those subjects. Another block of Medical School buildings adjoining these is nearly completed; it is hoped that they will be available for the Australasian Congress. These are for anatomy and physiology and they will permit certain recommendations of the General Medical Council to be properly complied with, namely that anatomy and physiology shall be continuously applied throughout the period of clinical study. There are two denominational colleges for men and a single college for women, which are distributed about the town, the general arrangement conforming more or less to that existing at Oxford and Cambridge.

The history of the Otago University Medical School dates from 1876 when a combined chair of anatomy and physiology was established with the late Millen Coughtrey as professor. Clinical teaching was attempted from the beginning, but the facilities were at first very inadequate so that students had to go home to complete their instruction and they could not at this period obtain recognition of courses taken in New Zealand. This, however, came in time, the University of Edinburgh being the first to give recognition largely owing to the representations of Dr. J. H. Scott, who succeeded Dr. Coughtrey in 1877, other British schools soon followed the example of Edinburgh. In 1883 the Medical School was able to give a complete medical curriculum and its courses were accepted by the University of New Zealand for degrees in medicine. The first graduate who took his whole course at Otago qualified in 1888, but it remained a common practice for some years for students to go to England or Scotland for their

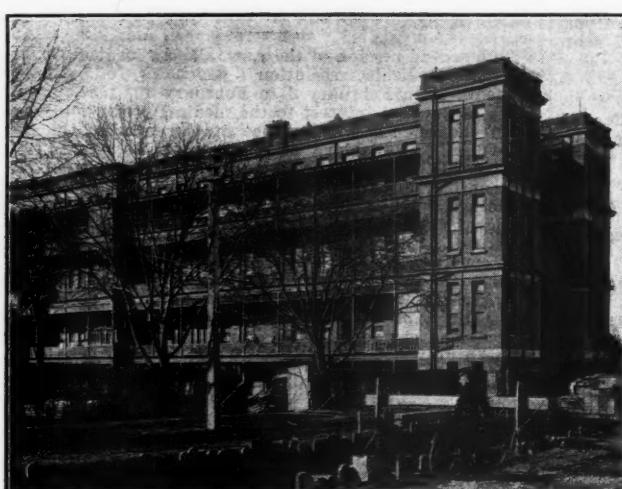


FIGURE II.
Dunedin Hospital: Main Building.
(Published through the courtesy of the *Otago Witness*.)

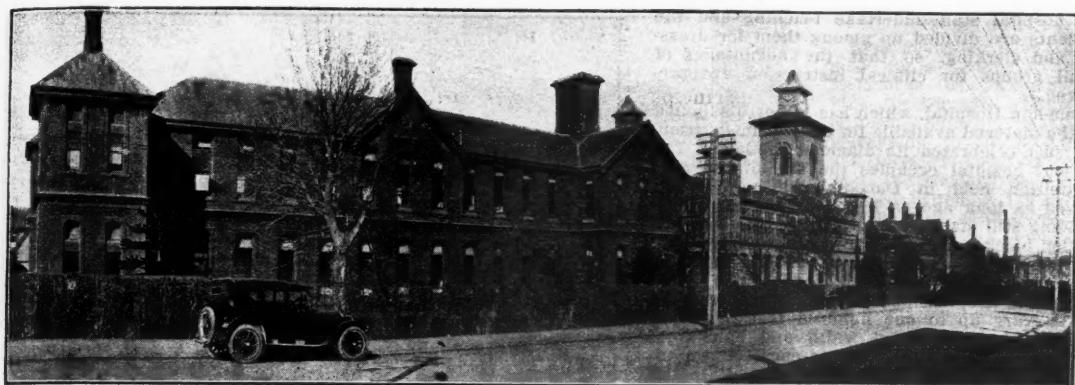


FIGURE III.
Dunedin Hospital: General View.
(Published through the courtesy of the *Otago Witness*.)

clinical work; that is now very rarely the case. Dr. Scott remained Dean of the Medical School till 1914 and saw it grow from nothing at all into an institution capable of providing the excellent corps of officers of the New Zealand Medical Corps in the Great War.

The public of Otago has been generous in providing funds for the requirements of the School, which have been aided by Government subsidies. Of late the Government has independently provided very large sums and the institution is definitely recognized as the Dominion Medical School.

This is not the place to describe in detail the steps whereby the School has acquired its present staff and accommodation; it will be sufficient to note the general arrangements which obtain at the present time. The modern buildings and equipment and the more recently established professorial chairs have permitted research to be undertaken in some of the problems of particular importance in New Zealand, for instance in endemic goitre, in consequence of which steps of practical value in public health have already been taken.

The present teaching staff consists of twelve professors and twenty-five lecturers and senior assistants, together with junior demonstrators. The medical course has recently been extended to six years, the first year is occupied with intermediate subjects and may be spent in

any of the centres. The second and third years are given up to the first professional subjects, anatomy and physiology, which can only be studied at Otago. In the third year students attend the hospital for some preliminary instruction and the three final years are spent in clinical

subjects and the allied studies of pathology and bacteriology, together with forensic medicine, medical jurisprudence, public health and so forth. Public health and preventive medicine are insisted upon throughout the clinical course. There is a combined chair of bacteriology and public health and it is continually pointed out to students that in a sparsely settled new country the healthy ordering of the life of the community will largely lie in their hands.

The Professors of Pathology and Bacteriology are respectively chief pathologist and bacteriologist to the Dunedin Hospital; the new Medical School is only just across the road from the hospital, so that these subjects can be very closely applied to clinical work and serology and biochemistry are largely employed in diagnosis and treatment. A new X ray department is about to be opened.

Recently half-time chairs in medicine, clinical medicine and surgery have been instituted, so that a large amount of time is given by the professors to clinical instruction besides their courses of lectures. In addition, all members of

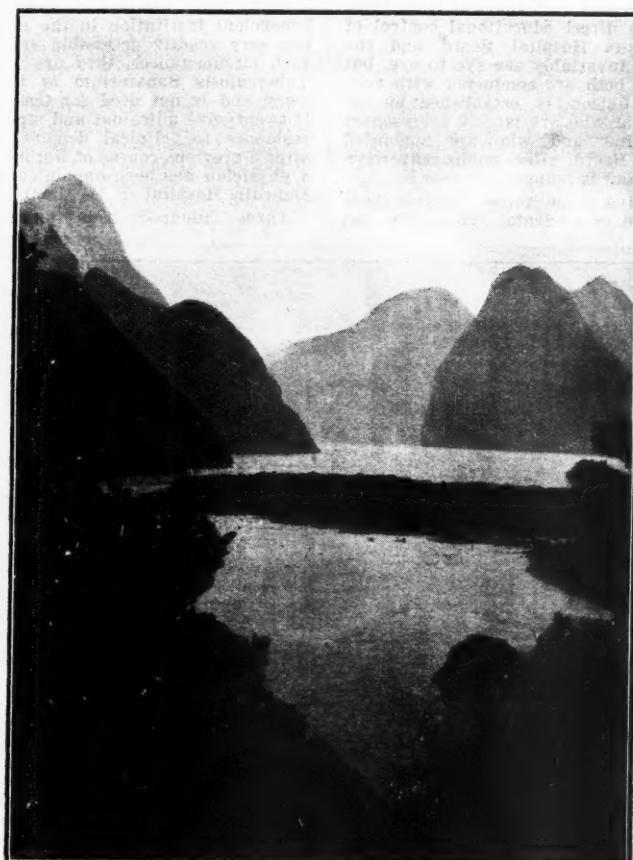


FIGURE IV.
Milford Sound from Sheerdown Range.
(New Zealand Government Publicity Photograph.)

the hospital staff undertake teaching and the students are divided up among them for dressing and clerking, so that the advantages of small groups for clinical instruction are preserved.

Dunedin Hospital, which has hitherto supplied all the material available for clinical instruction, has just celebrated its diamond jubilee. The present hospital occupies the site of the first Exhibition held in Dunedin, whither it was moved as long ago as 1866; the old exhibition building still stands and is used as the administration block. Around it are grouped four ward-pavilions, three of two storeys and one of three. They have been gradually added and mark stages in hospital design, but in general the wards vary up to one hundred feet in length and twenty-five feet in width and hold from sixteen to twenty-four patients each. They are well lighted, ventilated and warmed, with a tall window between each pair of beds on each side of the ward. Two pavilions have balconies capable of taking beds. Each ward has a "sun-room" and two small "special" rooms. The hospital contains about three hundred beds. The operating theatres, though not very modern, are adequate.

The hospital is rate-supported and is managed by a board popularly elected every two years, without direct representation of either the hospital staff or the University, although a member of each sits upon the hospital committee of the Board, but by a recent arrangement the Dean of the Medical School is in direct educational control of the hospital. Naturally, the Hospital Board and the Faculty of Medicine do not invariably see eye to eye, but on the whole the affairs of both are conducted with very little friction. The real liaison is established by the honorary staff of the hospital who are largely represented on the Faculty of Medicine, and who are appointed annually by the Hospital Board after public advertisement; in practice the same staff is reappointed year by year.

The hospital thus contains some three hundred beds available for the instruction of students. There are also

a small fever hospital, a hospital for tuberculosis and a

benevolent institution in the neighbourhood, but they are

not very readily accessible and as generally happens in

such circumstances, they are not much used. The main

Tuberculosis Sanatorium of the district is forty miles

away and is not used for teaching; the Mental Hospital

is twenty-five miles out and students go there for a week's

residence for clinical demonstration in mental diseases

after a previous course of lectures on the subject. Recently

a physician has been appointed for the care of patients at

Dunedin Hospital in the incipient stages of disease.

Three hundred beds provide a large amount of clinical material, but the stay of each patient in hospital is a long one, owing to lack both of convalescent homes and infirmaries, so that the actual number of patients admitted is less than in a hospital of the same size in a large city and the out-patient attendance is naturally not a large one. However, every kind of case required for instruction in the principles of medicine and surgery is available in the wards in the course of the year and with care and economy of cases adequate clinical experience is obtained. All students do three complete terms both of ward clerking and surgical dressing and care is taken that a definite period is spent in male, female and children's wards.

As has been mentioned, the course has recently been extended from five to six years, thus conforming to the practice in the Australian States. It was felt to be essential that New Zealand should maintain a similar high standard of medical education to that of Australia, and when practicable it is the custom to invite Australians to act as exam-



FIGURE V.
Dunedin Hospital: Another View.
(Published through the courtesy of the *Otago Witness*.)



FIGURE VI.
Te Anau: Milford Track.
(New Zealand Government Publicity Photograph.)

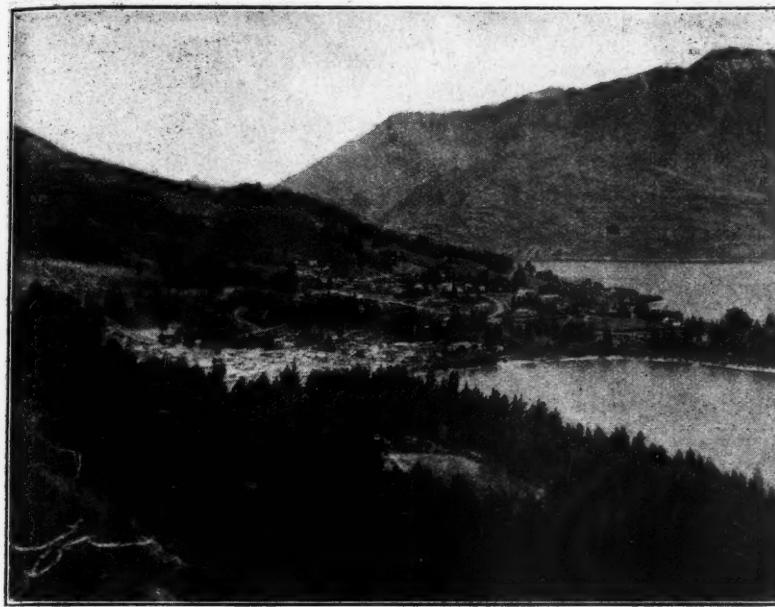


FIGURE VII.
Queenstown, Remarkables and Lake Wakatipu.
(New Zealand Government Publicity Photograph.)

iners. When the six years' course was decided upon, the New Zealand Branch of the British Medical Association urged very strongly that the sixth year should be made a purely clinical year which might be spent in any one of the other centres at the student's discretion, in order to extend clinical experience and make use of the cases available elsewhere. This was impracticable, since two terms of the three, in the additional year, were required for the intermediate and first professional subjects, but the addition of the remaining term allowed of three complete years for clinical work.

An arrangement has been made with the hospital boards and the members of the honorary staffs in the other centres who have undertaken to provide the necessary clinical teaching in a very public spirited manner, for it will add considerably to their duties. Students will henceforward be able to take one, two or three terms of their final year at the hospital of any other centre. They will thus after two years of clinical training have access in small groups to the entire practice of a considerable hospital, with great opportunities for extending their clinical experience.

The above is a brief account of the way in which the problems of systematic teaching and clinical instruction are met in the Medical School of the Dominion of New Zealand.

THE SOUTH ISLAND.

Arrangements have been made for a steamer to leave Melbourne on January 26, 1927, for Dunedin, calling at Milford Sound. Members journeying to the Congress will have an opportunity of using the overland route from Milford Sound, a route that is renowned throughout the world for its wonderful scenery. An impression of the commencement of the track will be gathered from one of the accompanying pictures.

From Dunedin the members can visit some of the most beautiful lakes in the Dominion, can indulge in the famous sport of fishing for which the New Zealand streams are noted, and can exert muscular energy in climbing giant mountains. Facilities for all kinds of excursions will be provided, so that no matter what the tastes of the visiting member may be, he may rest assured that they will be gratified.

It is scarcely necessary to point out that the visiting members of Congress who elect to travel to Auckland or

Wellington, will be able without much loss of time to visit the famous hot springs of Rotorua and other places of interest in the Northern Island. Information as to the best routes and accommodation will be supplied in Dunedin either prior to the Congress or during the sessions. Notices concerning excursions will be published later.



FIGURE VIII.
South Fiord Lake; Te Anau.
(New Zealand Government Publicity Photograph.)

Post-Graduate Work.

THE POST-GRADUATE HOSTEL IN LONDON.

REFERENCE has been made in these columns (August 26, 1926, page 291) to the arrangements that have been made to provide facilities for overseas and provincial members of the medical profession attending post-graduate courses in England to reside under one roof and to receive social and professional assistance during the period of their stay in London. The Committee of the Post-Graduate Hostel are holding meetings at the Imperial Hotel at which various subjects of importance are discussed.

On July 27, 1926, Professor H. Finsterer, of Vienna, dealt with the treatment of gastric ulcer and advocated extensive gastrectomy. He employed splanchnic and gas-oxygen anaesthesia and was very careful to be as gentle as possible. He claimed that the mortality is low. Sir William de Courcy Wheeler, of Dublin, and others took part in the discussion.

On July 30 the subject for discussion was the difference between hyperplasia and inflammation. Sir G. Lenthal Cheatle opened the discussion. On August 5 Dr. P. Manson-Bahr initiated an interesting discussion on tropical diseases in London. On August 12 Mr. A. P. Bertwistle demon-

strated a method of enhancing the value of radiograms. It was found at times that the skin outline was seen in the X ray negative, but not in the print. He showed that if the outline be scratched on the negative before printing, a silhouette could be superimposed on the skilogram. This was used to demonstrate many classical signs. On August 17 Mr. Donald Armour dealt with head injuries and Dr. L. Long, of Oklahoma, recounted his experience. On August 19 Dr. Harold Scott started a debate on tuberculosis among animals in captivity which appears to have been highly interesting. Mr. McAdam Eccles told his colleagues on August 24 when not to operate for hernia. Others gave their views. On August 26 there was a meeting at which the subject of the treatment of acute appendicitis was handled. Mr. R. J. McNeil Love, of London, Mr. G. MacGregor, of Johannesburg, and others took part.

From the foregoing it will be seen that the scientific debates organized by the Committee of the Post-Graduate Hostel will prove of much value to visiting practitioners.



FIGURE X.
Cascade Falls, Preservation Inlet, South Island.
(New Zealand Government Publicity Photograph.)



FIGURE IX.
Trout Fishing in the Waian River.
(New Zealand Government Publicity Photograph.)

Obituary.

CHARLES THOMAS ABBOTT.

WE regret to announce the death of Dr. Charles Thomas Abbott which occurred at Payneham, South Australia, on October 14, 1926.

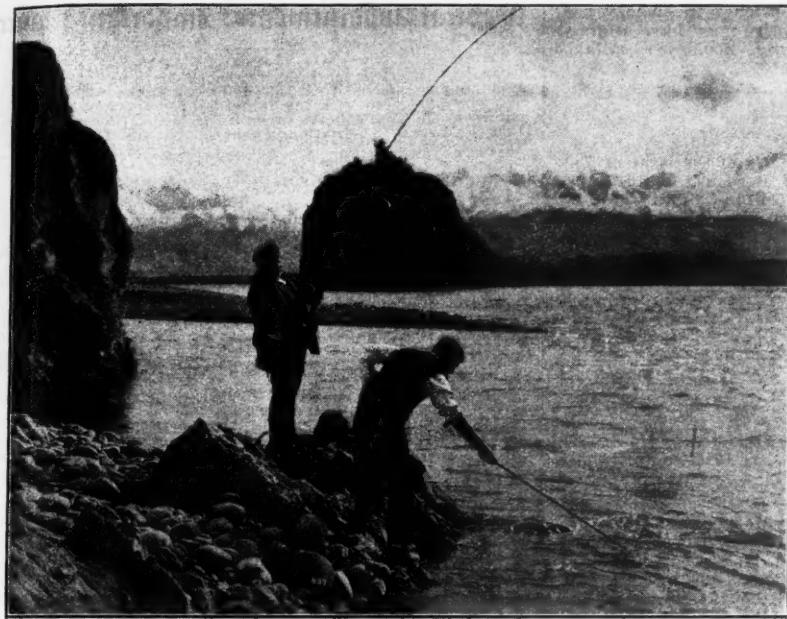


FIGURE XI.
Lake Kanieri.
(New Zealand Government Publicity Photograph.)

Charles Thomas Abbott was born at Hobart, Tasmania, and studied medicine at the University of Louisville, Kentucky, United States of America. He obtained the degree of doctor of medicine at that university in 1894. He practised in the United States for some years and came to Victoria in 1906. He subsequently went to the Northern Territory and finally settled in South Australia. Here he practised at various places until compelled by ill-health to retire. He is survived by a widow and two sons, one of whom is a medical graduate of the University of Adelaide.

University Intelligence.

THE UNIVERSITY OF SYDNEY.

At a meeting of the Senate of the University of Sydney held on October 11, 1926, the following degrees were conferred *in absentia*:

Bachelor of Medicine.—George Thomas Hamlyn Harris, Allan Frederick Smith.

Bachelor of Medicine and Master of Surgery.—Alan Robert East, Louie Mansel Fraser, Roy Alan Maxwell, Emil John O'Sullivan, James Muir Smith, Alfred William John Stocks.

Master of Surgery.—Kevin James Collins, Colin Spencer Graham.

The Diploma in Tropical Medicine was awarded to Dr. Rayner Laming Bellamy. This is the first award of this diploma and the Senate extended its congratulations to Dr. Bellamy as the first recipient.

The following appointments were approved:

Dr. R. E. Nowland as Honorary Demonstrator in Anatomy.

Dr. Holmes à Court as co-examiner with Dr. John MacPherson in the subject of *Materia Medica and Therapeutics* at the forthcoming Fifth Degree Examination in Medicine.

Dr. H. R. Seddon as Acting Lecturer in Veterinary Pathology and Bacteriology.

On the recommendation of the Conjoint Board of the Royal Alexandra Hospital for Children Dr. R. K. Lee Brown was appointed as Honorary Assistant Urologist at that Hospital.

The recommendation of the Faculty of Medicine that the Degree of M.D. be awarded to Dr. J. E. Bateman was approved.

On the recommendation of the Faculty of Science the following conditions were approved in respect of the prize established by Mrs. Chase in memory of her daughter Eleanor Chase:

1. That the prize be known as the Eleanor Chase Memorial Prize.
2. That this prize be awarded at the Second Year Exam-



FIGURE XII.
Gold Dredging on the Buller River.
(New Zealand Government Publicity Photograph.)

ination in Science for general proficiency in Zoology provided that any candidate for this prize must have attained in the opinion of the Professor of Zoology a suitable standard of merit.

NOTICE:

INQUIRIES have been made for a copy of the issue of THE MEDICAL JOURNAL OF AUSTRALIA of December 2, 1916. As this issue is now out of print, the Editor would be grateful to any reader who has a copy to spare and is prepared to send it to the office of the journal.

Proceedings of the Australian Medical Boards.

VICTORIA.

THE undermentioned have been registered, under the provisions of Part I. of the *Medical Act 1915*, as duly qualified medical practitioners:

Farrell, William George, M.B., B.S., 1926 (Univ. Melbourne), 16, Laura Street, Moonee Ponds.

Freeman, William John, M.B., B.S., 1926 (Univ. Melbourne), Mortimer Avenue, Hobart, Tasmania.

Kinsella, Victor John, M.B., Ch.M., 1923 (Univ. Sydney), 57, Collins Street, Melbourne.

Richardson, Arnold, M.B., B.S., 1921 (Univ. Melbourne), c/o Dr. Richards, Whitehorse Road, Box Hill.

Additional Qualifications Registered.

Springthorpe, Annis Guy Hale, M.R.C.P., 1924 (London).

Books Received.

PERNICIOUS ANEMIA, by Frank A. Evans, M.D.; 1926. Baltimore: The Williams and Wilkins Company. Demy 8vo., pp. 178.

THE DUODENAL TUBE AND ITS POSSIBILITIES, by Max Einhorn, M.D.; Second Edition, Revised and Enlarged; 1926. Philadelphia: F. A. Davis Company. Demy 8vo., pp. 206, with illustrations. Price: \$3.00 net.

A PRACTICE OF PHYSIOTHERAPY, by C. M. Sampson, M.D.; 1926. St. Louis: The C. V. Mosby Company; Melbourne: W. Ramsay. Demy 8vo., pp. 620, with illustrations. Price: 50s. net.

THE SURGICAL TREATMENT OF GOITER, by Willard Bartlett, A.B., A.M., M.D., D.Sc., F.A.C.S., with a Foreword by Dr. Charles H. Mayo; 1926. St. Louis: The C. V. Mosby Company; Melbourne: W. Ramsay. Crown 4to., pp. 365, with illustrations. Price: 42s. net.

Medical Appointments.

Dr. John Johnston has been appointed Acting Chief Health Officer of the Commission of Public Health, Victoria.

Dr. Jack McKenzie Woods (B.M.A.) has been appointed Government Medical Officer at Catherine Hill, New South Wales.

Dr. John Kenneth Harbison (B.M.A.) has been appointed Government Medical Officer at Wyong, New South Wales.

Medical Appointments Vacant, etc.

For announcements of medical appointments vacant, assistants, locum tenentes sought, etc., see "Advertiser," page xx.

ST. VINCENT'S HOSPITAL, SYDNEY: Honorary Radiologist.
SYDNEY HOSPITAL: Clinical Assistant.

Medical Appointments: Important Notice.

MEDICAL practitioners are requested not to apply for any appointment referred to in the following table, without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C. 1.

| BRANCH. | APPOINTMENTS. |
|--|--|
| NEW SOUTH WALES: Honorary Secretary, 30-34, Elizabeth Street, Sydney. | Australian Natives' Association. Ashfield and District Friendly Societies' Dispensary. Balmain United Friendly Societies' Dispensary. Friendly Society Lodges at Casino. Leichhardt and Petersham Dispensary. Manchester United Oddfellows' Medical Institute, Elizabeth Street, Sydney. Marrickville United Friendly Societies' Dispensary. North Sydney United Friendly Societies. People's Prudential Benefit Society. Phoenix Mutual Provident Society. |
| VICTORIAN: Honorary Secretary, Medical Society Hall, East Melbourne. | All Institutes or Medical Dispensaries. Australian Prudential Association Proprietary, Limited. Mutual National Provident Club. National Provident Association. |
| QUEENSLAND: Honorary Secretary B.M.A. Building, Adelaide Street, Brisbane. | Members accepting appointments as medical officers of country hospitals in Queensland are advised to submit a copy of their agreement to the Council before signing. Brisbane United Friendly Society Institute. Stannary Hills Hospital. |
| SOUTH AUSTRALIAN: Honorary Secretary, 12, North Terrace, Adelaide. | Contract Practice Appointments at Ceduna, Wudinna (Central Eyre's Peninsula), Murat Bay and other West Coast of South Australia Districts. |
| WESTERN AUSTRALIAN: Honorary Secretary, Sain't George's Terrace, Perth. | All Contract Practice Appointments in Western Australia. |
| NEW ZEALAND (WELLINGTON DIVISION): Honorary Secretary, Wellington. | Friendly Society Lodges, Wellington, New Zealand. |

Diary for the Month.

Nov. 2.—Tasmanian Branch, B.M.A.: Council.
Nov. 3.—Western Australian Branch, B.M.A.: Council.
Nov. 4.—South Australian Branch, B.M.A.: Council.
Nov. 4.—Section of Orthopaedics, New South Wales Branch, B.M.A.
Nov. 5.—Queensland Branch, B.M.A.: Branch.
Nov. 9.—Tasmanian Branch, B.M.A.: Branch.
Nov. 9.—New South Wales Branch, B.M.A.: Ethics Committee.
Nov. 9.—Section of Medicine, New South Wales Branch, B.M.A.
Nov. 10.—Victorian Branch, B.M.A.: Branch; last date of nominations for Council.
Nov. 11.—Victorian Branch, B.M.A.: Council.
Nov. 11.—New South Wales Branch, B.M.A.: Clinical Meeting.
Nov. 12.—Queensland Branch, B.M.A.: Council.
Nov. 12.—Victorian Branch, B.M.A.: Annual Conference.
Nov. 13.—Victorian Branch, B.M.A.: Annual Conference.

Editorial Notices.

MANUSCRIPTS forwarded to the office of this journal cannot under any circumstances be returned. Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary be stated.

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